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VETERINARY MEDICINE

APRIL 1945

CONTENTS

Veterinary Progress, Policies and Comment.....111-114

Synthetic Blood Plasma Developed, 111; What Is Meat? 111; Bronze Star Medal, 111; Endocarditis Sometimes Due to Brucellosis, 111; New Division of Food Technology, 111; Undulant Fever Reported by U. S. Public Health Service, 111; Army Veterinary Service Safeguards Health of Troops, 112; American Veterinary Service in Foreign Countries, 112; Revised Deferment Policy 112; Code Regulates Preparation of Cheddar Cheese, 113; Walker-Gordon Laboratory Sold, 113; Veterinary Unit Wins Citation, 113; Power Sprayer for Treatment of Ox Warbles, 114; New Meat Packer By-Product, 116; Veterinary Officer Saves Dutch Cattle, 116; Institution of Nutrition at M.S.C., 116.

Serum Producers Association Exonerated.....115

Report for 1944 of Chief of the B A I.....117

Effective Action of Penicillin Prolonged.....118

U. S. Livestock Sanitary Association Meeting.....119

Reminiscences 129

Genital Involvement in Swine.....131

Topical Application of Sulfanilamide.....134

Respiratory Diseases of Poultry.....137

Canine Leptospirosis in Antigua.....139

Clinical Reports 141-144

Lymphatic Leucemia in a Dog, 141; Atrophy of the Optic Nerve in a Dog, 141; Rectal Impaction in a Dog, 142; Pyometra in a Bitch, 142; Hematoma of the Testicle of a Dog, 143; Correction, 143; Acute Mastitis with Toxemia in a Mare, 143; In Yesteryears, 144.

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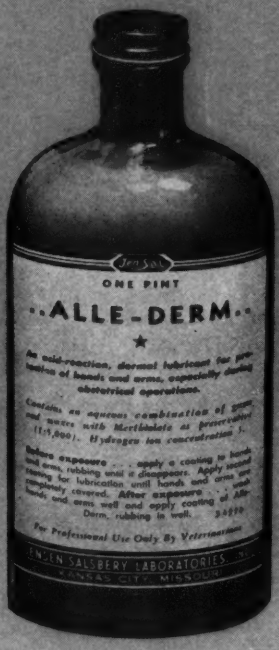

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D. M. CAMPBELL, *Editor*
7632 S. Crandon Ave., Chicago 49, Ill.
Telephone South Shore 7160

H. J. MOSTYN, *Eastern Representative*
P. O. Box 121, Sussex, New Jersey
Telephone Sussex 2F18

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The facts of yesterday may become the fads of today and the fallacies of tomorrow.—F. B. Hadley.

Seventy army medical officers were killed in action and an additional 113 died in the military service, during 1944.

In the first five weeks of 1944, 184 cases of undulant fever were reported to the U. S. Public Health Service. In the same period this year the number was 354 cases.

Call and associates of the Mayo Clinic report *(Am. J. Clin. Path.)* two cases of endocarditis due to brucellosis and express surprise that the condition is not reported more often than it has been in the past "in view of the frequency of Brucella infections in the general population."

Test of the homing flight of carrier pigeons, by the U. S. Army Signal Corps, indicate that radio transmission confuses them. Pigeons released near a broadcasting station circled about aimlessly for about 20 minutes and were delayed even longer in reaching their home cote when broadcasting was in progress. Control birds released when the station was not in operation were unaffected.

If, after collapse of Germany, 1000 soldiers are discharged per hour it will require nine months to discharge 1,800,000—the number that it has been tentatively estimated may be released at the close of the war in Europe. Three thousand six hundred passenger trains would be required to transport them to their homes after they reach American shores.

Officially only the flesh of cattle, sheep and swine is meat. Use of the word "meat" to apply to the flesh of other animals and birds must be qualified by the species name as turkey meat, horse meat, deer meat, etc.

Swedish scientists have developed a method for producing synthetic blood plasma from a by-product of sugar manufacture. The product is called "Dextran" and unlimited production is said to be possible. It can be transported in powder form and its use is not dependent on the blood type of the recipient.

A division of food technology has been established at the Massachusetts Institute of Technology to study post-war problems of world food production, including improvement of the products and methods for retaining natural flavors and nutritive values in processed foods. The program includes a new five-year course offering special opportunities for returning service men.

From experiments conducted at the National Institute of Health, Peck and Hewitt concluded that several members of the ringworm group of fungi produce an antibiotic substance closely resembling penicillin in its characteristics. The concentration (two to 10 oxford units per cc) in the culture media tested was so low as to make extraction and purification impractical.

Bronze Star Medal

Col. Danield H. Mallan, V.C., has been awarded the Bronze Star "for meritorious service during the period March 12 to Sept. 10, 1944" in the China Theater.

Army Veterinary Service Safeguards Health of Troops

A censored despatch from Paris, France, states: Trained veterinary officers and enlisted technicians stationed in Q.M. depots, cold storage plants, general hospitals and the famous Pasteur Institute in Paris, are charged with the vital job of protecting the health of American troops against disease transmitted through damaged, deteriorated and contaminated foodstuffs.

"Nearly 28 million pounds of perishable meat and dairy products were handled during the month of January alone," said Captain Donald J. Francisco, 235 Meridan Drive, Dearborn, Michigan, Chief of the Veterinary Division of Seine Section in the Paris area.

This vast quantity of food received veterinary inspections on receipt, during storage and prior to shipment to advanced troops, and issue to troops in the immediate area.

Veterinarians practically meet the truck convoys and trains, and newly arrived foodstuffs receive their first inspection upon receipt at a large quartermaster depot. The first sorting consists of selecting the obviously bad cartons and containers and, in the case of perishable foodstuffs, the setting aside of questionable cartons of beef, butter or eggs for a more detailed inspection. Refrigerator vans and rail cars are checked for temperature, condition and sanitation upon arrival and before loading for shipment forward.

Those items salvageable are immediately issued to local troops or repacked for shipment to points further front. As a result of exacting inspection and prompt decisions, surprisingly small amounts of foodstuffs are lost. This and the advice on the proper methods in the storage and utilization of foodstuffs have also resulted in a financial saving to the government.

When items are initially received, they are inspected for condition and sanitation. Seine Section veterinary officers and trained enlisted technicians advise and make recommendations as to whether it will stand up under long term storage, whether it should be issued immediately, or whether it will be condemned as unfit for human consumption.

From the time when a food item is prepared in the U. S. until its reception overseas at a food depot, it will have been handled at least 10 times. Veterinarians maintain a constant check at as many intervals as possible all along the way, to determine if the food can stand further shipment, and the length of time it can be expected to remain in good condition. Food finally issued to troops is thus assured A-1 edible condition.

Captured Horses

Captured German horses now being used for draft purposes are also under the watchful eyes of the Army's Veterinary Service. Widespread outbreaks of glanders in Germany were caused by Russian horses captured in the Ukraine and shipped back to the Reich at the time of the invasion of Russia.

American Veterinary Service for Foreign Countries

The extensive plans of the Army to undertake animal disease control in occupied and liberated countries is indicated by the large number of veterinary officers who are being sent to the School of Military Government, Charlottesville, Va. Eighteen veterinary officers are now on duty at the school.

Revised Selective Service Deferment Policy

Selective Service now requires every male veterinarian, between the ages of 18 through 37 to submit or have submitted by his employer an "Affidavit for Occupational Classification" to the Procurement and Assignment Service Committee for Veterinarians for certification and transmittal to the local board having jurisdiction over the registrant. This is an amendment of Local Board Memorandum No. 115. Forms to be filled out follow:

Age Group 18 Through 29

DSS Form 42-A (Special Revised) *not disqualified for service;* two (2) in triplicate, forms obtainable from the state chairman.

Age Group 30 Through 33

DSS Form 42-A; one original and one copy, obtainable from local board.

Age Group 34 Through 37

DSS Form 42; one original and one copy, obtainable from local board.

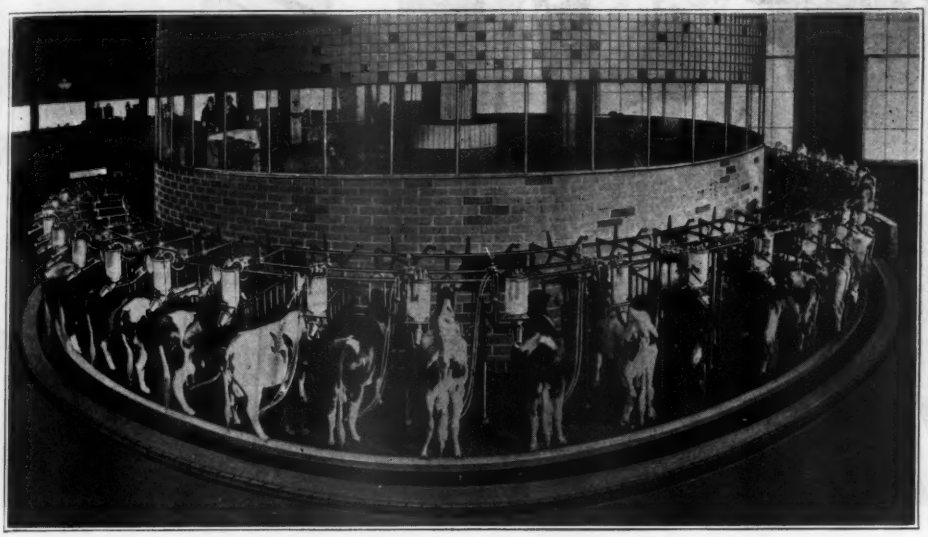
Disqualified for Service

DSS Form 42; one original and one copy by all veterinarians (18 through 37) *disqualified for service* on application for a commission or at Army Induction Station. Each must indicate (with evidence) his disqualification and by what agency.

Deferred classifications are for a period not to exceed six months and affidavit must be submitted before the expiration of each deferred classification. All II-A or II-B will be reopened by local boards not later than 1 April 1945. No deferred classification will be continued or established unless an affidavit certified by Procurement and Assignment is in hands of the local board at the time of consideration for deferred classification.

New York has amended the State Sanitary Code to prevent the sale of uncured cheddar cheese made from raw milk. Unless the cheese itself is subjected to heat equivalent to pasteurization it must be made from milk, skim milk or cream that has been pasteurized or it must be ripened or cured at a temperature of not less than 35° F. for a period not less than 60 days from date of manufacture.

County agents in Wisconsin say that unless bounty payments are resumed on wolves and an open season declared on bears the northern part of the state will have to discontinue sheep raising, owing to the depredations of these predators. Pigs and poultry also are being lost to them in large numbers. Partridges, rabbits and other small game are being rapidly depleted by the same marauders.



SUPER MILKING MACHINE IN A CERTIFIED DAIRY

The Rotolactor, a rotary milking combine at the Walker-Gordon Laboratories Company, Plainsboro, N. J. This super milking machine consists of a revolving circular table, 60 feet in diameter and contains 50 stalls in which cows are washed, dried and milked while they make one complete circuit, which requires 12½ minutes. The apparatus is equipped with milking machines, milk weighing scales and facilities for washing cows. It is capable of milking 1,680 cows three times daily and requires about two men to operate it, or eight men in four six-hour shifts. It is used in a herd producing certified milk for distribution in New York City. The table turns continuously but slowly, and one cow is constantly entering it for a 12½-minute ride and another always leaving it to return to her place in the cow barn. This dairy was one of the sightseeing trips incidental to the International Veterinary Congress in New York in 1934

Walker-Gordon Laboratory Company Sold

The plant of the Walker-Gordon Laboratory Company, Plainsboro, N. J., leading producer of certified milk for the New York market, has been sold by the Borden Company to Mr. Henry W. Jeffers and associates. Mr. Jeffers has been associated with the company since 1898 and was president of it from 1918 to 1942.

The Walker-Gordon Laboratory Company has developed many fundamental improvements in milk production, among them being the famous rotolactor, development of dehydrated forage crops, specialized medical, veterinary and laboratory supervision of milk and supplement of the dairy ration with vitamin A for greater milk production.

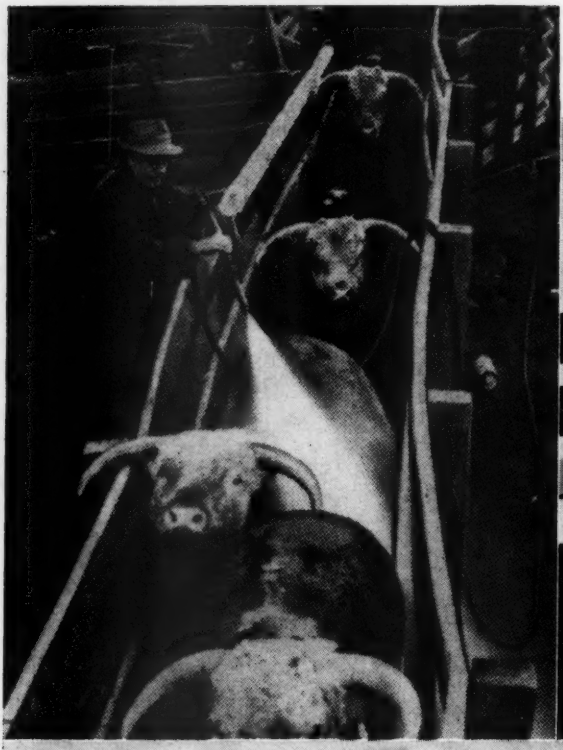
Veterinary Unit Wins Citation

MERITORIOUS SERVICE UNIT PLAQUE—Award Medical Department Detachment (Veterinary Service) of Station Complement, Fort Snelling, Minnesota, for superior performance and outstanding devotion to duty in food inspection for a period of over two years.

The outstanding manner in which these inspection are conducted is evidenced by the high esteem that various private industries have for this unit.

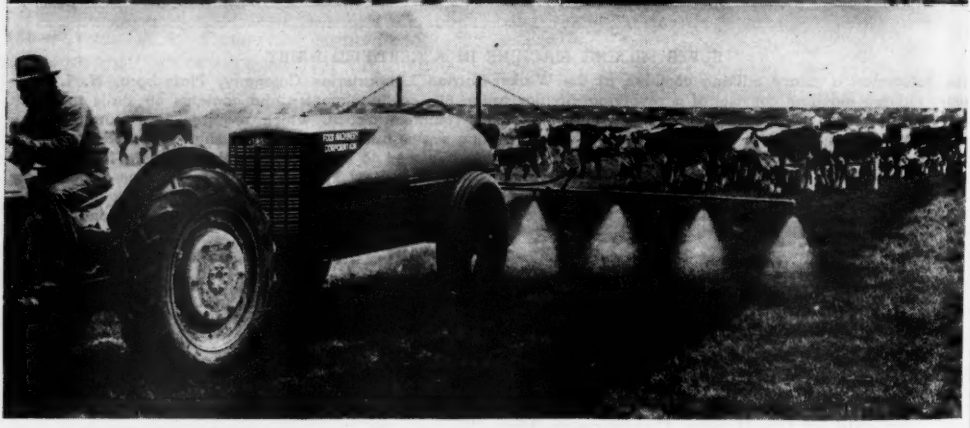
The superior degree of military and professional efficiency that this unit enjoys was achieved by meritorious individual conduct of its personnel and its high esprit de corps, superior overall administrative record and outstanding discipline and morale.

By Command of Major General Danielson.



Left: Treating range cattle for ox warbles. The spray is applied at a pressure of 250 to 400 pounds

Below: The hand "gun" with many uses about the farm and ranch



The illustration (upper left) shows a versatile power sprayer, developed by Food Machinery Corporation, in use in the war against the cattle grub which causes a loss of $100,000,000 annually in damaged hides and meat, reduced milk production and retarded growth and gain in cattle. The sprayer develops up to 400-pound pressure at the nozzle. When a parasiticide is directed onto the backs of cattle with it the spray passes through the hair, blows away the dirt, grease and scabs and penetrates into the openings in the skin and reaches the larval grubs, killing them. The lower illustrations show the sprayer being used to spray a solution of cane syrup and water onto salt grass which is unpalatable for cattle. After the grass is thus sweetened cattle are said ot eat it readily. The same equipment may be used also to kill weeds in lawns, gardens and pastures. With the hand nozzle weeds in fence rows and corners can be killed. Uses about the barnyard are many—kill flies in the dairy barn and lice, mites or other vermin in the chicken house, rid hogs of lice, paint the barn in a few hours and whitewash the interior equally rapidly; or it may be used to spray fruit trees. Its most important use, however, just at this time is against the cattle grubs which will soon be leaving the animals for further development in the ground. It is estimated that grubs destroyed enough leather in 1941 to supply a million marching men with shoes for the whole year. When the sprayer is not in use it may be filled with water for use in case of fire

Members of Associated Serum Producers Exonerated

"A complete vindication for the policy of the defendant companies to sell their products only to veterinarians" was the characterization of the verdict of "not guilty" in the trial of 14 serum companies and various officials of each company, which was concluded in Chicago, February 16th.

The indictment which was returned in the United States district court for the Northern District of Illinois, May 28, 1942, in effect charged members of the Associated Serum Producers, Inc., with violation of the Sherman anti-trust law by agreeing among themselves to restrict the sale of anti-hog cholera serum and hog cholera virus to graduate veterinarians. From one to three of the officials of each of the member companies also were made defendants. Other charges were included and, in the beginning, the sale of all animal medicines and biological products used in the treatment of disease among animals was involved. However, as the trial progressed, it soon became apparent that the interest of the prosecution was limited to the restricted sale of serum and virus and all else was dismissed from consideration by the jury. This outcome was accurately forecast in these pages in the announcement of the indictment (*Vet. Med.*, July, 1942, page 276); not through any prescience but because of a sure conviction as to the incentive for the prosecution.

The trial lasted two weeks. Shorn of legal verbiage and unimportant collateral matters, the Government attempted to prove, (1) that there was an agreement among the defendants to restrict sales of anti-hog cholera serum and virus to graduate veterinarians and (2) that this was an unreasonable restraint of trade in that it prevented many swine owners from obtaining these products and cost others unnecessarily large sums of money by forcing them to employ veterinarians to do work they could do as well for themselves. The defendants denied (1) that any agreement to restrict sales of their products had ever existed, (2) that even if such an agreement had existed it was not unreasonable but in the best interests of the livestock industry. They further denied that the policy of the defendants had prevented anyone from purchasing serum and virus since it was always available from other firms whose sales were not restricted.

The evidence of the prosecution was wholly circumstantial and was based on the facts (1) the defendant companies had formed an association (in 1933), (2) all members of the association had the same sales policy and (3) all defendants contributed to an advertising fund which was administered by the American Foundation for Animal Health, a subsidiary of the Associated Serum Producers, and used largely in farm publications and on the radio, to persuade livestock owners to employ veterinarians to vaccinate their swine.

Witnesses for the defendants, aside from representatives of the defendant companies, were: Dean H. D. Bergman, Iowa State College; Dean R. R. Dykstra, Kansas State College; Dean W. A. Hagan, New York State Veterinary College; Dr. J. S. Koen, Storm Lake, Ia.; Mr. Murray Barker, Thornton, Ind.; Dr. N. R. Harwood, Manhattan, Kan.; Dr. A. Kushner, Topeka, Kan.

The defendant companies were: Allied Laboratories, Kansas City, Mo.; Blue Cross Norden Serum Co., Superior, Nebr.; The Columbus Serum Co., Columbus, Ohio; Corn Belt Laboratories, Inc., and Corn Belt Serum Co., East St. Louis, Ill.; The Corn States Serum Co., Omaha, Nebr.; Fort Dodge Laboratories, Fort Dodge, Ia.; Grain Belt Supply Co., Omaha, Nebr.; Jensen-Salsbery Laboratories, Kansas City, Mo.; Liberty Laboratories, Inc., Omaha, Nebr.; The Missouri Valley Serum Co., Kansas City, Kan.; the National Laboratories Corporation, Kansas City, Kan.; The Gregory Laboratory, White Hall, Ill.; Norden Laboratories, Lincoln, Nebr.; and The Southwestern Serum Co., Wichita, Kan.

The jury reached agreement in just about the shortest period in which it is possible to elect a foreman and sign a verdict of "not guilty." Thus bringing to a salutary end a long drawn out case that should never have been commenced. As stated previously, the prosecution relied upon three and only three contentions—an association was formed in 1933, all members had the same sales policy and that policy constituted an unreasonable and, therefore, unlawful restraint of trade. The facts, easily available to the grand jury that voted the "true bill," were: Each of the defendant companies had long followed the restrictive sales policy (some of them for as long as 20 years) before the association was formed and none changed its policy at the time the association was formed nor since. There was no restraint of trade in the sense that anyone was prevented from obtaining serum or virus. Manipulation to increase

prices, the basis for nearly all anti-trust suits, was not even charged. As for the restrictive policy being unreasonable, a mass of evidence was presented based upon the action of the Secretary of the U. S. Department of Agriculture in recognizing and dealing directly with this group under the serum-virus marketing agreement; also upon statements of Dr. John R. Mohler, former chief of the Bureau of Animal Industry and many other federal and state officials to show that, far from being unreasonable, restricting the sale of anti-hog serum and virus to those trained scientifically to use it is highly desirable in the interest of the swine industry. Testimony was introduced supporting this claim by three deans of veterinary colleges, by Doctor Koen and by numerous veterinarians representing the serum companies.

The verdict is a complete vindication of the officials of the serum companies in the matter of the charges against them. They have been subjected to much inconvenience, annoyance and expense for which, regrettably, they have no redress. In a larger sense, the verdict was a victory for sanity in disease control and should bring nearer the time when the distribution of agents capable of spreading disease among livestock, or of interfering with official disease control measures, will be restricted by laws and regulations. At present this seems far in the future but sometimes such changes come quickly.

To thine own self be true and it must follow as the night the day thou canst not then be false to any man

Commenting upon this indictment when it was returned nearly three years ago, it was stated (*Vet. Med.*, July, 1942, page 276) ". . . it is the fundamental policy of limiting the distribution of potent pharmaceutical and biological products to those who are qualified to use them, that is under adjudication. If this wise and necessary policy is held to be lawful it will be firmly established. If found in contravention of the anti-monopoly statutes, other means of protecting the livestock industry from the folly of some of those engaged in it will have to be found." That seems to just about sum up the situation as it stands today. Lay or professional disease control is no longer before the court; but it is still on trial with the livestock industry and with the public in the role of jury.

New Meat Packer By-Product

Research workers at the University of Illinois Medical School, Chicago, have developed a cheap method of changing animal tendons into a tough plastic with many uses. Threads of any diameter can be made from the material and it can be compressed into slabs, tanned and used for shoe soles. It can be applied as a tough waterproof coating to fabrics for use as clothing or upholstery. In the process the tendons are shredded, treated with acid to break up the tissue and passed through chemical washes. The product resulting is a pure extract of collagen—a cloudy, gelatinous liquid which is then processed and tanned.—*Nat'l Prov.*, 112:7.

Veterinary Officer Saves Dutch Cattle

Many newspapers recently carried an Associated Press dispatch from Holland telling of the assistance given Dutch farmers by Major Harry Gorman, V.C., a veterinary officer with the Allied Headquarters military mission. After the dikes were blasted by allied and enemy bombing, Major Gorman helped the farmers move out as much as possible of their best livestock ahead of the waters that rushed over the rich farmland of Walcheren Island. Only cattle and horses could be saved and, of the former, many famous herds were lost, but a nucleus of most blood lines was saved. The animals were evacuated in barges. No attention could be given to pigs and chickens all of which were drowned.

Institution of Nutrition at M.S.C.

A new service organization, known as the Institute of Nutrition, has been established at Michigan State college. It aims at the coordination and integration of instruction and research in nutrition.

The Institute of Nutrition will supply a contact between industry and the college to further research in food and nutrition and will supply the food industry with results of the laboratory. It in no sense competes with or supplants research of the experiment station, but rather will supplement it through additional funds and will make possible a fresh approach to pertinent problems through a coordinated effort of the central organization.

The Institute will receive aid for its maintenance from the college, and it is hoped that industry, trade associations and agricultural organizations will provide grants for research and industrial fellowships so that the scope and extent of the work may be materially increased.

B.A.I. Chief's Annual Report for 1944

THE report of the Chief of the Bureau of Animal Industry, United States Department of Agriculture, for the fiscal year ending June 30, 1944, is a record of substantial achievement in a wide field of livestock production, research and disease control. Most of the activities of the Bureau were reported during the year as information on the results became available; nevertheless, bringing them together in one report constitutes an impressive exhibit of accomplishment.

Among the diseases, the unknowns of which were probed by research, were: vesicular diseases, equine encephalomyelitis, hog cholera, equine infectious anemia, bovine brucellosis, swine brucellosis, bovine mastitis, Johne's disease, swine erysipelas, anthrax, swine paratyphoid, poionous plants, pullorum disease, fowl typhoid, avian lymphomatosis, bovine coccodiosis, coccidiosis of poultry, anaplasmosis of cattle, ancylostomiasis and others—truly a comprehensive list of food-production saboteurs. The efficacy and methods of administration of various parasiticides also were investigated. It is estimated that phenothiazine is already preventing losses that would normally cost livestock producers 10 million dollars a year.

While no new disease control projects were undertaken during the year, worthwhile progress was made, with a single exception, in the campaigns that have long been under way, against diseases. The eradication of the cattle tick is 99% complete, dourine is almost eliminated; cattle scabies is in the same category; sheep scabies is mainly confined to small Mid-West flocks (in which it is fostered by community sales) and some progress was made in hug cholera and swine erysipelas control.

The bovine brucellosis eradication project alone, of all the activities of the Bureau, reflects no credit upon it. The year completes the 10th year of this project and the showing is indeed a sorry one. The men in the field have performed a difficult task exceptionally well, but the central direction has been incompetent. In 10 years the project has cost the cooperating states $21,000,000, the federal government an unspecified amount and the livestock industry an incalculable sum. Accomplishments are dwarfed beside this huge expenditure. The reports, which leave untold more than they tell, show there has been no reduction in the percentage of positive reactors in the last seven years or since the project was switched from a cattle reduction program to one of disease eradication. This and interim reports show that about 600 counties have been declared modified accredited areas, but they do not show how many of these counties were placed in this list because of a reduction in the incidence, or how many are in it because of a natural low incidence of the disease. By way of illustration: The positive reactors in North Carolina from 1935 to 1941 inclusive, before all the counties were modified accredited areas, averaged 1.8% of the cattle tested. In the last month of the 10-year period, when all counties in the state were modified accredited areas, the number of positive reactors averaged 2%.

The reports state that there are now approximately 43 thousand accredited brucellosis free herds but they do not tell how many were freed of the disease by test and slaughter and how many were found free of the disease on the first test. Its a fair guess that there are several times that many brucellosis free herds in the country, that have not yet been found and credited to the project.

Even if the reports were accepted at face value the showing is far from reassuring. The total accredited herds after 10 years is less than 2% of the number under supervision. At the same rate, eradication of the disease from this limited group would require 500 years. In the last month of the 10-year period, the percentage of reactors was higher than the average for any year since the first three, at which time highly infected herds were selected for the purpose of cattle reduction. Of nearly 600 modified accredited counties, fewer than one-eighth are in important dairy states.

After 10 years there is yet no uniformity of rules in the various states and there exists a confusion of requirements for interstate shipment as it is effected by brucellosis or its absence or by vaccination.

But the greatest lack of vision in directing the project has been the obstinate refusal to take advantage of vaccination until it was forced from the outside and the continued failure to make full use of it. Even now the man who vaccinates his calves and retains his reactors is penalized by being cut off from indemnity for the reactors later. He is offered indemnity if he will slaughter his reacting animals and thus reduce, by the amount of their production, the national milk supply. If he holds them, even in a vaccinated herd, thus contributing to an increased food production, he is cut off permanently from obtaining an indemnity for them. The vaccination of adult animals, even when they were associated with

infected cows, has subjected both owners and their veterinarians to official calumny. There is as yet little official encouragement of vaccination and the amount of unofficial vaccination is estimated to be 12 times as great as official vaccination (392,232 calves during the year). Unfortunately, much of the unofficial vaccination has been driven into lay hands by official opposition to it. The handling of disease is a matter too complex for any but experts. How much hindrance to eradication this lay vaccination may constitute cannot be foretold at this time. It is a matter for concern, particularly in view of the great care necessary to preserve the quality of the vaccine.

Another failure to even approach realism was the slaughter of more than 11,000 reacting cows in the last month of the 10-year period—in June, 1944, when there was an acute shortage of fluid milk, butter, cheese and ice cream, and when the W.F.A. was entreating the dairy industry to increase its production.

But the situation contains promise in spite of the inefficient leadership in charge of the project. The Chief of the Bureau is taking a hand in it. It was he who made the report on the year's work in brucellosis control at the recent meeting of the U. S. Livestock Sanitary Association. That circumstance is as significant as it was unusual. He says we cannot hope to eradicate brucellosis by any one method and that all applicable and available methods will be used. This seems to mean the period of riding hobbies or catering to fetishes is over. He states that the vaccination of adult animals is as effective as the vaccination of calves and in certain classes of herds vaccination of adult animals is a valuable means of control, which is about as much as can be said for any method. There is no panacea for the brucellosis problem. Indiscriminate slaughter of reactors is not the answer. The Brucella organism is a resourceful antagonist. The able Chief of the Bureau is sound when he plans to fight it with all means available. That is what should have been done for a decade.

While the foregoing discussion may seem to dwell overmuch on faults for the sake of grumbling; such is far from the intention. The veterinary profession is committed to the eradication of bovine brucellosis. Its official leaders have been given complete charge of the project. Its reputation is at stake and that concerns all of us, not just the officials in charge. The veterinary service of this country has never yet failed in any disease eradication program it has undertaken when given unhampered control of the project. It is vitally important, in the allotment of similar projects in the future, that it does not fail in this one. Breaking practically all precedents, the Chief of the Bureau is taking a hand in directing the operation of the brucellosis eradication project. He is injecting good, hard, common sense into it. It is important that he be given unanimous support in his efforts. That is likely to be accorded, only if it is fully realized that the project has been proceeding haltingly and that new policies are required to turn it into the way of success.

In the administration of the Federal Virus-Serum-Toxin Act for the production of serums, vaccines, diagnostic and similar products used in combating animal diseases more than 5,000,000 inspections and 70,000 rejections of animals intended for use in the production of veterinary biological products were reported.

The Bureau's control over the quality of such biological products included 8,270 potency tests and 10,178 purity tests of anti-hog cholera serum and hog cholera virus; supervision over the production of more than 2,500,000,000cc of those products; similar supervision over 2,500,000cc of antitoxins, and 300,000,000cc of bacterins, toxoids, diagnostic and other products. The Bureau's inspectors supervised the destruction of 175 batches of brucellosis vaccine found to be of unsatisfactory quality. Other duties included control over imports and exports of veterinary biological products.

Effective Action of Penicillin Prolonged

Efforts are constantly being made to discover methods for prolonging the effective action of penicillin. A recent experiment at the Navy Medical Research Center consisted in the use of an ice-bag applied over the site of injection of penicillin for one hour before and five hours after the administration of 50,000 units. The effective blood level was maintained for five hours as compared to two and one-half hours usually maintained when the same size dose is administered in saline. This was found effective in nine out of 10 cases.

In efforts along the same line it has been found by the Western Reserve School of Medicine that excretion of penicillin when taken *per os* can be slowed considerably by giving sodium bicarbonate with it. Although this method of administration is more convenient for both the patient and the physician the method has been used little because, on account of the rapidity of excretion, it has been difficult to reach a sufficiently high blood level to be effective.

U. S. Livestock Sanitary Association

THE 47th annual meeting of the U. S. Livestock Sanitary Association, held in Chicago, Dec. 6-8, 1944, although not so well attended as most of the recent meetings of this association, enjoyed a scientific program of more than average interest. The officers elected for the coming year were, President, C. U. Duckworth, California; 1st Vice President, Wm. Moore, North Carolina; 2nd Vice President, Will J. Miller, Kansas; 3rd Vice President, J. V. Knapp, Florida. As this association customarily advances its officers year by year to the presidency, this was, in effect, selecting Dr. Knapp for president in 1948. Dr. R. A. Henderschott, State Veterinarian of New Jersey, was re-employed as Secretary-Treasurer.

Bovine Brucellosis

The discussion of bovine brucellosis was led by Dr. A. W. Miller, Chief of the Federal Bureau of Animal Industry, who pointed out that when the test and slaughter plan of brucellosis control was adopted 10 years ago the plan was primarily a cattle reduction program and the test and slaughter method fitted into it at that time. At present, test and slaughter is a valuable measure in states where the incidence of infection is low and as a final measure in the clean-up of most herds. It must sometimes be resorted to in herds supplying fluid milk to cities because of board of health regulations. But we cannot hope to eradicate brucellosis by the test and slaughter method alone or by any other single method. The disease should be fought by the most applicable and most adaptable means at hand.

In 1936 the Bureau commenced calf vaccination in 220 herds. Of those herds, 179 are still in existence and 171 are still employing vaccination; the remaining eight herds are now accredited. There is a great interest in vaccination at the present time and a great deal of vaccinating is being done; most of it unofficial.

The Chief stated tests of vaccination of adult cattle in 369 herds involving 27,000 animals have shown that it is as effective as calf vaccination. However, the Bureau is not yet ready to recommend adult vaccination in brucellosis free herds. It can be advised in incipient outbreaks of brucellosis in beef herds and in dairy herds where calves are not raised and replacements are purchased frequently. Also inferentially, although not stated, where reactors are retained in the herd after testing, thus exposing the non-infected, mature animals to infection.

The immunity to brucellosis induced by vaccination is lowered gradually over a period of years. The Bureau is investigating the effectiveness of intradermal vaccination but is not yet ready to accept it.

The expiration date of brucella vaccine which has heretofore been six months from the date of manufacture has been set back to three months; investigation shows that in a six-month period many of the organisms in the vaccine are no longer viable.

C. M. Haring, University of California, gave a further report on the use of Strain 19 vaccine in California where this vaccine has been used in controlled tests for a decade. Uniformly good results have been attained over that period in both calf and adult vaccination.

Calf vaccination has given the best results in infected herds. A greater degree of immunity is produced if the animals are not vaccinated until they have reached approximate sexual maturity. The vaccination of calves younger than six months of age is ineffective or nearly so, according to California experience.

Calf vaccination alone in infected herds as the principal control measure is inferior to the vaccination of both calves and mature animals. Obviously, adult animals that are not infected need protection from the infection being disseminated by the infected animals, quite as much as do the calves in the same herd.

Tests of many samples of vaccine revealed that only 50% of the organisms are viable at the end of six months after the vaccine is manufactured. This in vaccine that was handled under the best of conditions. Inferentially, but not stated, much of the vaccine now being distributed for lay use contains few or no living organisms.

Supporting this view for greater care of the vaccine made from Strain 19 was a discussion by W. F. Verway, Glenolden, Pa., who stated that when it is made there are 10 billion viable organisms in the vaccine per cubic millimeter, but that the number decreases rapidly with age. He has attempted to prevent this loss of efficiency by lyophilization, a technic of dessication while frozen. The results have been very promising.

E. L. Stubbs, University of Pennsylvania, described a method of attenuating *Brucella abortus* by electrical vibrations rather than by the usual means.

Swine Brucellosis

L. M. Hutchins, Purdue University, led the discussion on swine brucellosis. *Brucella suis* infection in swine is an important cause of loss in some swine herds; in others it may be of little consequence. Frequently the number of observed abortions, due to swine brucellosis, are not large. Swine contract the disease readily at any age. Pigs farrowed by infected sows may develop some immunity and as gilts may not abort but some of them will be carriers and will perpetuate the infection.

Sterility is frequently an outstanding symptom of swine brucellosis. The fertility of the herd may be reduced as much as 50% by the infection. Adhesion of the testicles to the surrounding tissues was the first symptom seen in breeding boars in one purebred herd.

The agglutination test is adequate for herd diagnosis in swine brucellosis, but it is not dependable as an individual test. Control of swine brucellosis, at the present time, must be based upon the agglutination test. Where reactions occur to the agglutination test at dilutions of 1:25 or higher, all breeders in the herd should be regarded as infected and disposed of for slaughter when the pigs are weaned. Gilts from litters in which there are no reactors may be saved for breeders. All others should be disposed of. A better plan is to eliminate the whole herd and start over with non-infected stock.

The caretakers of infected herds should be cautioned of the danger to themselves from infection with *Brucella suis*.

Hemorrhagic Dysentery in Swine

This was the subject of a discussion by L. P. Doyle, Purdue University. Hemorrhagic dysentery is only one of several enteridites in swine. It is essentially a colitis and cecitis and rarely a gastritis. The losses vary from a few animals to 50% of the herd or even more. They average about 25%. Usually vibrios may be isolated in great numbers, sometimes in nearly pure culture, from the affected mucosa. This disease is called also bloody diarrhea, bloody scours, bloody flux and black scours.

In the beginning there is diarrhea; the feces being mixed with mucus. The mucus is soon replaced by blood. The loss of weight is rapid and at times there may be marked weakness, but usually there is less depression than in other diseases.

On opening the abdomen the cecum and colon may be red. The changes in the mucous membrane are superficial, contrasting in this respect with hog cholera.

The disease is spread chiefly by traffic in diseased and exposed feeder hogs, and occasionally by breeding swine. It is readily controlled by slaughter, quarantine and sanitation.

Swine Disease Prevalence

The report of the committee on transmissible diseases of swine was made by the chairman, H. C. H. Kernkamp, University of Minnesota. The committee regretted that only limited information on the prevalence of disease among swine is available to the live-

VESICULAR STOMATITIS IN SWINE

Fig. 1. Note the blanching in the region of the coronary band where a vesicle had formed. The slit-like opening at the upper margin of the blanched area shows where the vesicle had just ruptured. All the blanched skin could have been removed easily, exposing an angry red surface.

The photographs from which these illustrations (Figs. 1 to 6) of vesicular stomatitis were made are from the film, "Vesicular Diseases of Animals," prepared by the Pathological Division of the Bureau of Animal Industry. Charts I and II are from the same source. All were supplied through the courtesy of the B.A.I. As noted elsewhere this film is available for showing at veterinary meetings. A 16mm sound projector is required

stock sanitary authorities of the various corn-belt states. Replies to a questionnaire sent to those authorities indicate that the numbers of hogs in the principal swine raising states attained an all-time high in 1943. As a consequence the committee had expected the greatest disease prevalence on record but such did not materialize. It was to be expected that although the number of swine was less in 1944 than in the preceding year that there would be enough residual infection carry-over to insure a greater than usual prevalence of disease last year. However, the incidence of transmissible disease of swine was lower than normal and it is the conclusion of the com-

mittee that transmissable diseases are not a major factor in swine production.

Thirteen states reported less hog cholera than in 1943; two states reported the same amount. Less influenza and swine pox than was experienced during the preceding year was reported in all states. Swine erysipelas was reported to be less prevalent in five states and the same in five states as during 1943. The indications are that this disease is spreading eastward and southward. Eight states reported less enteritis and 12 reported more brucellosis in 1944 than in 1943. A decrease in parasites of swine was reported in two states; an increase in five states and no change in three states.

Vesicular Stomatitis in Swine

H. W. Schoening, of the Federal Bureau of Animal Industry, discussed vesicular stomatitis in swine and other animals briefly and presented a motion picture sound film, Vesicular Diseases of Animals, which shows the symptoms and lesions of this disease in the various farm and laboratory animals with emphasis on its differentiation from foot-and-mouth disease and from infectious exanthema of swine.

Fig. 2. Vesicular stomatitis in swine; showing blanching at the coronary band in both a front foot and a hind foot. Vesicles are forming beneath these blanched areas. Note the lateral dew-claw of the rear foot also is involved

SUSCEPTIBILITY OF SPECIES

VIRUS	HORSE	BOVINE	SWINE	GUINEA PIG
VESICULAR STOMATITIS	+	+	+	+
VESICULAR EXANTHEMA	±	−	+	−
FOOT-AND-MOUTH DISEASE	−	+	+	+

Clinically these three diseases are indistinguishable and inoculation tests must be made to distinguish them where the history is doubtful. The following charts show the susceptibility of species to vesicular diseases and the results of inoculation tests with the virus of each of these diseases.

RESULTS OF INOCULATION

VIRUS	ROUTE OF INOCULATION		
	LOCAL	INTRAMUSCULAR	INTRAVENOUS
VESICULAR STOMATITIS	+	−	±
VESICULAR EXANTHEMA	+	±	±
FOOT-AND-MOUTH DISEASE	+	+	+

Since the inoculation procedures and their

Fig. 3. Vesicular stomatitis in swine; showing deformity of the foot 3½ months after the appearance of acute lesions

interpretation are exacting, only persons with technical knowledge and experience in such matters should assume the responsibility of making final diagnosis. However, the Bureau urges that every veterinarian become familiar with the symptoms and lesions of the three diseases under consideration, as well as the principles of differentiating them. The occurrence of any vesicular disease should be reported immediately to the state livestock sanitary authorities or to a representative of the U. S. Bureau of Animal Industry.

Vesicular stomatitis has occurred on numerous occasions in widely separated areas of the United States since about the time of World War I. Exact data as to the extent and identity of the disease have not been available, owing to incomplete reporting and only limited confirmatory diagnoses. Horses and cattle have been involved to about an equal extent, and one serious outbreak was encountered in swine at a licensed veterinary biological establishment in 1943.

Vesicular exanthema has been prevalent in swine on the West Coast for more than a decade. Fortunately, this disease has been restricted thus far to one state. Both vesicular exanthema and stomatitis, which frequently so closely resemble foot-and-mouth disease as to be clinically indistinguishable from it, are established in this country. Foot-and-mouth disease has not occurred here since 1929, when it was eradicated through prompt slaughter and destruction of affected and exposed susceptible animals. One of the major objectives of livestock sanitarians is to keep this foreign plague out of the country. However, if despite all prophylactic measures the disease should make its appearance here, prompt and accurate diagnosis is essential to prevent spread and to forestall serious economic loss.

Fig. 4. Vesicular stomatitis in swine; showing recently ruptured vesicle on the snout

Fig. 5. Vesicular stomatitis in a cow. Recently ruptured vesicle at site of inoculation on the tongue

A malignant form of foot-and-mouth disease appeared for the first time in South America last year. With vastly increased shipping and with a greater number of U. S. ships calling at ports all over the world the stage is set, as never before, for outbreaks of foot-and-mouth disease. Veterinarians are urged to be on guard against this serious plague and to report promptly, all suspect appearance of vesicular disease in cattle and swine. The film referred to is available for showing at veterinary meetings and those responsible for the

Fig. 6. Vesicular stomatitis in a cow. Note freshly ruptured vesicle at the site of a gingival inoculation

program of state and other veterinary association meetings are urged to procure it.

Quality of Meat Inspection Raised; Milk Inspection Standards Lowered

C. U. Duckworth, California Department of Agriculture, Chairman of the committee on meat and milk hygiene, reported that as a result of purchases of meat by the Army the standard of meat inspection had been materially raised in a large number of meat packing plants which had not previously been under federal inspection. It was urged that plans be made immediately to hold this gain and retain meat inspection on a high plane, in as many of these plants as possible, when the Army withdraws from the market.

C. U. DUCKWORTH
Administrator, Division of Animal Industry, California Department of Agriculture; President U.S.L.S.A.

The committee also reported, that owing to the disparity between demand and supply, the standards of milk inspection had been lowered and milk of a quality not acceptable under normal conditions had been permitted to enter the fluid milk market and the dairy products' market. It expressed the hope that when conditions were again normal the requirements for market milk and dairy products would be raised to pre-war levels.

Although it was not mentioned by the committee it is worth noting that meat inspection, which is wholly in the hands of the veterinary profession, was improved as a result of the enlarged demand for meat, but that the same increased demand for milk caused a material lowering of standards of inspection, in which the veterinary profession participates only in minor degree.

Avian Tuberculosis Eradication

H. R. Smith, General Manager of the National Livestock Loss Prevention Board, presented "an analysis of factors contributing to the difficulties of eradicating tuberculosis in poultry and swine." He gave the four principal difficulties as (1) lack of physical symptoms in tuberculous poultry, (2) lack of post-mortem inspection, (3) lack of veterinarians and (4) labor shortage.

Although the absence of clinical manifestations until the disease is far advanced is equally as true of tuberculosis of cattle, swine and man as it is of tuberculosis of poultry, the speaker thinks this lack of physical symptoms in the live bird explains the failure of the poultry departments of agricultural colleges to support the eradication project and urge it upon the poultry raisers in the North Central States where 50% of the flocks are infected.

Abdominal viscero of a naturally infected tuberculous chicken. Extensive lesions in the liver and the spleen with nodular lesions of the wall of the intestine. This condition would not be recognized on inspection of the live chicken

He credits our system of federal and state post-mortem inspection of cattle, the records of which gave us a true picture of disease conditions among cattle in all parts of the country, with having been an important factor in the pronounced success of the campaign to eradicate bovine tuberculosis. The showing of increasing losses each year gave impetus to

the organization of the campaign. If we had general post-mortem inspection of poultry the condemnations for tuberculosis in states where it is prevalent would create an incentive to get rid of it. What little post-mortem inspection of poultry we have, perhaps 7% of the output, has brought about regulations by the New York City and Chicago health departments, prohibiting the sale of eviscerated poultry in these cities except it has been inspected by an acceptable agency.

There has been a gradual increase in the amount of poultry inspected—from 17 million pounds in 1934 to 187 million pounds in 1944. The speaker predicted that after the war there will be a very rapid increase in the sale of eviscerated poultry. In recent weeks the War Department has placed a single order for eight million pounds of eviscerated poultry for shipment overseas. Sixty per cent of poultry condemnations on post-mortem inspection are for tuberculosis.

It is thought that obstacles 3 and 4 to the eradication of tuberculosis in poultry, lack of veterinarians and shortage of labor on farms, will be overcome after the war.

Not only is avian tuberculosis responsible for a large economic loss to the poultry industry but it is responsible for the loss of $3,000,000 worth of pork products annually and is believed to cause approximately 50% of the "no lesion" tuberculin reactions in cattle.

Vaccination for Avian Pneumoencephalitis

This discussion by J. R. Beach, University of California, was a continuation of a report made to the Association two years previously. In the earlier report, results obtained in the vaccination of chickens in the laboratory to protect them against artificial inoculation with pneumoencephalitis virus were given. They were highly encouraging.

This report dealt with the use of the vaccine in the field under controlled conditions.

The vaccine is prepared by inoculating chick embryos on the 12th day of incubation and continuing incubation until the embryos die. The embryos and the allantoic fluid are then removed from the shell and emulsified in a colloid mill or electric blender. The resulting emulsion is uniformly lethal by intramuscular injection (0.1cc) in dilutions of one to a million to one to a hundred million. Fourtenths of 1% of formalin is added to the undiluted emulsion after which it is stored for future use. When used, dilute as desired and bring the formalin percentage to 0.2.

In 1943, field trials were made on 20 poultry farms. Approximately 50,000 chickens were included in the experiment, one-half being vaccinated and the remainder used for controls. A natural outbreak of pneumoencephalitis from which records could be obtained occurred in only one of the 20 experimental flocks. In this flock 600 birds had been vaccinated at the age of two weeks. The conclusion was the birds were not appreciably protected, under field conditions, when vaccinated at that age.

Other conclusions from the 1943 trials were: (1) The vaccine has no adverse effect on chicks as young as two weeks of age or on laying pullets; (2) Vaccination with pneumo-

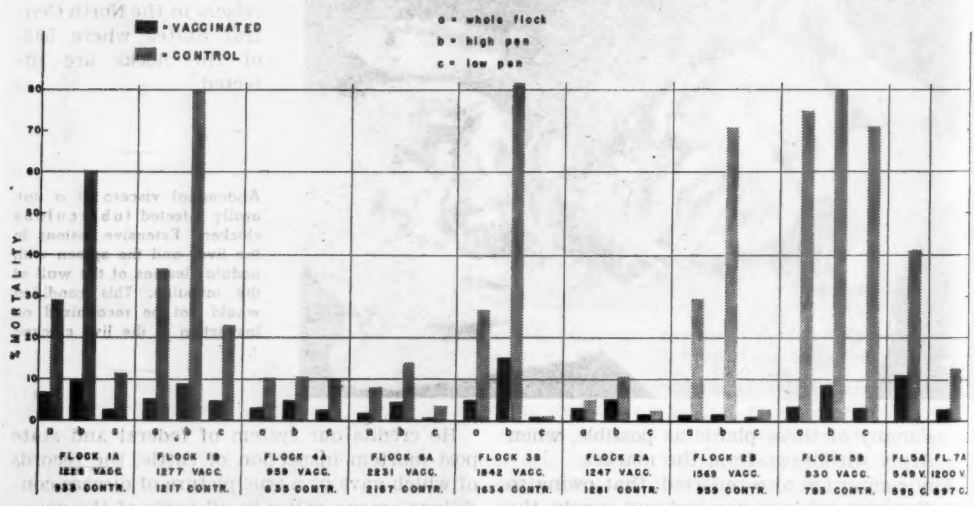


Fig. 1—Mortality from pneumoencephalitis in 30 days after the onset of the disease in the vaccinated and control chickens of 10 flocks

encephalitis vaccine and chicken pox or laryngotracheitis vaccine at the same time is a safe procedure and (3) With adequate assistants and facilities for catching, chickens can be vaccinated at the rate of 700 per hour.

In the 1944 trials, approximately 15,000 vaccinated and 13,000 controls were included. The chickens were all spring hatched pullets from three to four months of age when vaccinated. Exposure to natural infection occurred from one to six months later. The vaccine used varied in age from 40 to 509 days. The outbreaks of pneumoencephalitis, which occurred naturally in the various flocks, varied from mild to very severe. The disease appeared in all flocks in both vaccinated and control birds, but was uniformly more severe in the non-vaccinated controls. The mortality was from two to thirty times as high among the controls as among the vaccinated pullets, the average being about 10 times. The loss in egg production followed a similar trend. The comparative mortality (Fig. 1) and the comparative egg production (Fig. 2) are shown in the accompanying charts.

H. R. 5007

W. J. Butler, Montana, Chairman of the committee on legislation, urged all veterinarians and others interested in livestock disease control to obtain and study a bill before the Congress dealing with infectious diseases of dogs and other carnivorous animals. The proposed legislation is known as H. R. 5007 and copies are available from U. S. Representatives and Senators.

The committee appealed to the Meat Inspection Division of the War Food Administration to make available, to livestock sanitary authorities, the results of post-mortem examinations at federally inspected slaughter. Other measures for the collection of animal disease statistics were also urged upon the state and national authorities.

Veterinary Public Health

The scope of veterinary public health in the post-war world was discussed by I. A. Merchant, Iowa State College. In his view the niche of the veterinarian in public health includes (1) meat inspection, (2) milk inspection, (3) inspection of food products of animal origin and (4) control of diseases of animals transmissible to man.

Veterinary medicine has reason to be proud of its record in meat inspection. The federal meat inspection has prevented an incalculable amount of unwholesome product from getting

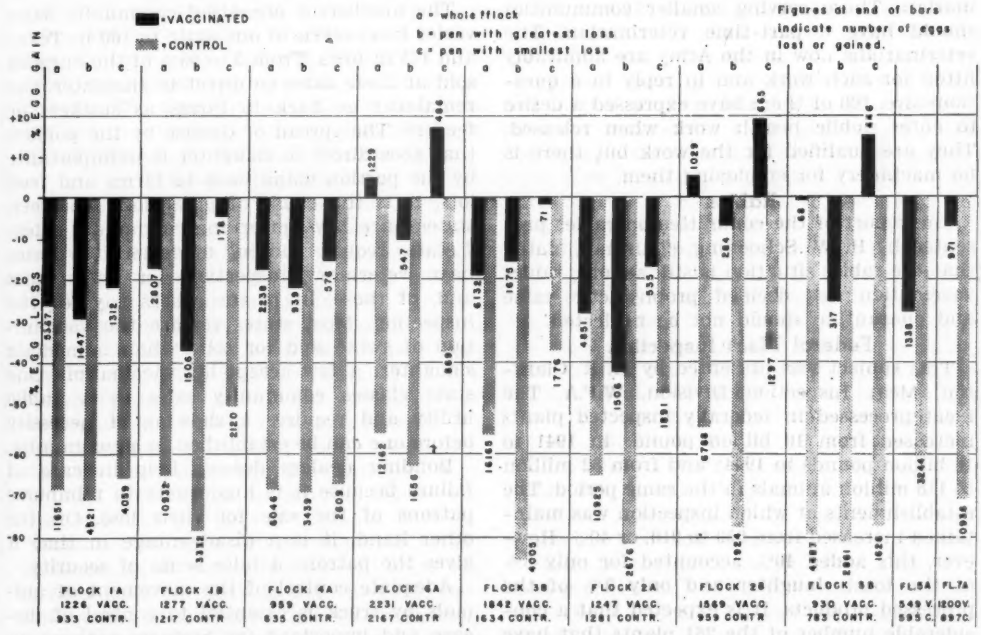

VACCINATED
CONTROL
a = whole flock
b = pen with greatest loss
c = pen with smallest loss
Figures at end of bars indicate number of eggs lost or gained.
% EGG GAIN
% EGG LOSS
FLOCK 1A 1226 VACC. 933 CONTR.
FLOCK 1B 1277 VACC. 1217 CONTR
FLOCK 4A 959 VACC. 835 CONTR.
FLOCK 6A 2231 VACC. 2167 CONTR
FLOCK 3B 1842 VACC. 1634 CONTR.
FLOCK 2A 1247 VACC. 1281 CONTR.
FLOCK 2B 1569 VACC. 959 CONTR
FLOCK 5B 930 VACC. 783 CONTR.
FL.5A 549 V. 595 C.
FL.7A 1200V. 897C.

Fig. 2—Loss or gain in egg production from the minimum normal egg-production expectancy of the vaccinated and control chickens of 10 flocks in 30 days after the onset of pneumoencephalitis. Normal egg-production expectancy was arrived at by multiplying the average daily production at the onset of the disease by 30. This is considered a conservative estimate since the age and quality of the pullets and the time of year were such that they would be expected to continue laying at the same or a higher rate for 30 days or longer. The decrease in egg production of vaccinated pullets was significantly less than in the unvaccinated

into the channels of trade. It has been responsible for an increased consumption of meat by the confidence which it has inspired in the product. This has benefited the meat producer, the meat processor and the general public.

Meat inspection should be extended until the civilian has the complete protection of his meat that the Veterinary Corps of the Army affords the military personnel. Thirty-five per cent of the meat consumed in this country receives inadequate or no inspection. Only California has met its responsibility in the matter of state meat inspection.

The dire need for poultry inspection is universally conceded, yet less than 7% of our total product is inspected at the time of slaughter.

Milk sanitation is woefully inadequate. The value of veterinary contributions to improved milk sanitation is unquestioned but it has been largely indirect, such as the eradication of tuberculosis, the reduction of mastitis and brucellosis. A larger participation by veterinarians in public health control of milk sanitation is urgently needed.

Every municipal health department and county health unit serving more than 100,000 persons should include a full-time veterinarian. Those serving smaller communities should have a part-time veterinarian. The veterinarians now in the Army are admirably fitted for such work and in reply to a questionnaire, 160 of them have expressed a desire to enter public health work when released. They are qualified for the work but there is no machinery for employing them.

Rabies

The report of the committee on rabies presented by H. W. Schoening, chairman, stated that the rabies situation is still serious, rabies vaccination has decided prophylactic value and quarantine should not be neglected.

Federal Meat Inspection

This subject was presented by M. R. Clarkson, Meat Inspection Division, W.F.A. The meat processed in federally inspected plants increased from 10 billion pounds in 1941 to 16 billion pounds in 1944; and from 82 million to 118 million animals in the same period. The establishments at which inspection was maintained increased from 659 to 910, or 40%. However, this added 40% accounted for only 5% of the total slaughter and only 3% of the processed products. It is expected that a considerable number of the 261 plants that have requested and been accorded federal inspection to enable them to supply meat for the Army will desire to continue to operate under such inspection after the war.

Limited inspection has been installed in 29 plants as a war measure. This inspection is limited only in that it applies to but part of the meat processed in the plant—the part supplied to the Armed Forces.

Because of restrictions on the use of building material during the past several years and lack of equipment, and the desire of establishments to expand and modernize their facilities, the indications are that there will be a tremendous building program in the meat packing industry after the war.

Community Sales

It would shatter precedent for a meeting of the U. S. Livestock Sanitary Association to pass without a discussion of community sales which have figured prominently among the factors contributing to the spread of disease among animals for the past dozen years. Frank Carr presented some community sales statistics and a few regrets. The fact is, additional legislation is required in many states and more comprehensive regulations in most of them to eliminate faults and stop practices at community sales that result in the unncessary spread of animal diseases. However, community sales are, to a large extent, children of the farm bureaus and therefore among the untouchables.

The number of organized community sales varies from seven in one state to 160 in Texas and 173 in Iowa. From 5 to 95% of the animals sold at these sales go direct to slaughter, the remainder go back to farms as stockers or feeders. The spread of disease by the portion that goes direct to slaughter is unimportant; by the portion going back to farms and feed lots, it is the cause of great loss. Fourteen states have laws governing community sales; 7 states require bonding of dealers; 16 states have veterinary inspection for their sales and, of these, in 14 the sellers pay for the inspection. Most states require the vaccination of swine sold for other than immediate slaughter; a few accept lay vaccination. One state classes community sales as a public utility and requires a showing of necessity before one can be established in a community.

Bonding dealers doesn't help in case of failure because it is inadequate to reimburse patrons of the sale for their loss. On the other hand, it is a disadvantage in that it gives the patrons a false sense of security.

Adequate control of the movement of animals by truck is essential to control of disease and important for business reasons. In one state several thousand hogs, trucked away from community sales last year, disappeared leaving no trace. A uniform bill of lading for all common carriers is needed.

Bovine Trichomoniasis

Banner Bill Morgan is not a radio commentator, as might be inferred from his attention arresting cognomen, which is in a class with Studs Terkel, Gunner Back, Bill Henry, Moulton Kelsey, Gabriel Heater, etc. He is a valuable member of the Department of Veterinary Science, University of Wisconsin. He discussed recent trends in the diagnosis of trichomoniasis. Banner Bill concludes from his research that a tentative clinical diagnosis of the disease may be made from the following symptoms Frequent heat periods; many abortions at three to 16 weeks of pregnancy many of which pass unnoticed; a watery discharge from the vagina, which varies from whitish to yellow and on standing, contains a large amount of yellow cellular deposit.

Microscopic examination of specimens may be carried out in the field and is often diagnostic. The trichonomads are found most easily and most plentifully in the alantoic fluid and in specimens from an aborted fetus. Often the organisms may be found in the discharge during estrum. The bull should always be examined. Rarely the organisms may be found in seminal fluid and often in swabs from the prepuce.

However, many cases may require laboratory procedure and culture on a special media to determine the presence or absence of trichomonads in clinical suspects. Identifying the organism is essential to a definite diagnosis. Neither the agglutination, the complement fixation or allergic tests are dependable in trichomoniasis, according to Banner Bill.

Bovine Mastitis

The meeting closed with a mastitis panel. Both prepared and impromptu questions from the audience were propounded. Assembling the more important of the several answers they appeared somewhat as follows:

Hendershott (New Jersey): Bovine mastitis is the most important economic problem confronting the dairy industry. Because of pasteurization some public health authorities do not regard mastitis as of significance to the milk consumer, but it is of public health significance because of the impaired quality of the milk secreted by an infected udder and because of the pus cells it contains. It is unfortunate that some veterinarians and many dairymen think chemotherapy will solve the mastitis problem. Such is not the case, prevention also is a desideratum. Chemotherapy will salvage 50% of the affected animals but intelligent methods of prevention conscientiously applied plus chemotherapy will avoid 80 to 90% of the loss at present sustained from mastitis.

Little (Rockefeller Foundation): Outstanding contributions of recent years to the solution of the problem of mastitis are improved methods of diagnosis and demonstration. Further simplification of diagnostic procedures are needed. Attempt should be made to find a means of control without medication. He has been able to keep herds free of mastitis without medication. He has nine such herds under his care now. In Connecticut they have 92 herds from which mastitis has been eradicated and kept out. Udder therapy should be used cautiously and only after a diagnosis has been definitely established. In England 21 quarters were infected with tuberculosis recently by udder infusion. Udder infusion is major surgery and should be done only by veterinarians. There is still merit in the old line therapy of large doses of sulfanilamide by the mouth and cathartics and frequent milking. Udder therapy makes possible the eradication of the infection from a herd at much less cost, but it should be used only in herds in which a *Str. agalactiae* program is underway. Little can be accomplished without the full cooperation of the owner.

In no case should acute cases of mastitis be infused. In such cases reliance should be upon sulfanilamide, purging and frequent milking.

Hopson (New York): Milking prior to calving lessens congestion which predisposes to mastitis and also lessens the stretching or breaking down of connections between the udder and the abdominal wall. All mastitis is due to traumatism. Even slight traumatism, such as cold floors, pinching the teat between the floor and the body, and rough milking predisposes to mastitis. Always examine the meatus of the teat. Often it is found to be slightly red. That is the time to begin mastitis treatment. Inject a small quantity of sulfanilamide in oil into the teat only. Physical examination of the udder is of great value in the control of mastitis. Physical examination of the udder is required by the Metropolitan Health Board. A survey showed that in herds supplying milk to the city only 3% of the animals had mastitis, in other herds in the same district the incidence was often up to 40%.

Schalm (California): In California, where cattle are not stabled at any season, mastitis is more prevalent in winter than in summer. It is probably due to exposure in wet weather, and chapped teats. Microscopic examination of stained smears is a reasonably effective method of diagnosis. Its weakness is that it does not admit of identification of the organisms. Gangrenous mastitis is due to staphylococcus infection. The care with which

the animals are milked has an important bearing on the severity of the disease. An example is seen in two state herds, one at a prison, the other at an indigent institution. At the prison good milking practices were employed, in the other herd the labor was inefficient. In two years there were 50 cases of mastitis in the prison herd and 90 in the other herd. At the prison 25% of the herd were positive to the strip cup test, at the other institution 45%. The brom thymol test was positive in 30 and 60%, respectively; fibrosis on physical examination in 46 and 70%, respectively. Three per cent of the prison herd and 38% of the other herd were sent to slaughter when a program of mastitis control was undertaken. The milker has an important influence not only on the incidence of the disease but also on its severity. Stripping is very necessary but must not be overdone. If the milk is not all removed much contamination is left in the udder.

Palmer (New Jersey): The Hotis test is a highly effective diagnostic procedure but the blood plate examination is 25% more accurate. Eighty per cent of the cases of mastitis are due to the *Str. agalactiae*. As a rule it is responsible for chronic mastitis; other organism cause most of the acute cases. Mastitis in heifers is usually due to *Staph. aureus*. Infusions of sulfanilamide, to be effective, must bring a considerable concentration of the drug into contact with infected tissues. Therefore sulfanilamide in oil as an udder infusion is the only effective method of apply ing the drug. Penicillin filtrate used as an udder infusion cured 90% of streptococci and 60% of *Staph. aureus* infection. In the future the sodium salt of penicillin will probably be used, but the cost of it will have to come down before it can be profitably employed in the treatment of mastitis.

Phillips (Wisconsin): The relationship between nutrition and mastitis is still debatable. However, in mastitis milk there is a decrease in ascorbic acid. A study of the relation of vitamin A to mastitis is in progress at the Kansas State College at the present time. It is harmful to start milking a cow before she has "let down" her milk and also to milk her after milk no longer comes down. This produces mechanical injury to the mucous lining of the teat if long continued. Five per cent silver oxide infusion is too irritating to use in lactating cows, but in non-lactating cows it is the most effective remedy. The use of silver oxide during lactation has resulted in as many as 4% of "blind" quarters.

Bryan (Michigan): All mammals are subject to mastitis, but it is far more common in cattle than in other species. The milk goat is the only animal in which the prevalence of mastitis is even comparable to that of cattle. The disease should be handled in this animal the same as in cattle. Not all mastitis is due to infection. It is curable only to the extent that the fibrosis due to the inflammation can be overcome. Preparturient mastitis is due to allowing calves to suck one another. Mastitis in calves and virgin heifers is often a serious problem. Calves turned out to pasture with apparently healthy udders are often brought in at the end of the season with well developed cases of mastitis. Such mastitis yields satisfactorily to udder infusion if treated early in the attack. The difficulty is, since animals of this age are not commonly handled, the disease frequently is not detected until there is much irreparable destruction of udder tissue. Preventing calves from sucking one another or themselves for a couple of hours after they are fed is an effective preventive of preparturient mastitis.

Tyrothricin is a useful agent for udder infusion. The dose is 125mg per quarter. If one or more quarters are infected all should be infused. Treatment is most successful during the non-lactating period, but may be undertaken as the cow approaches that period. The udder should not be infused during the full milk flow except in urgent cases. Sanitation is highly important in handling mastitis. Frequently 15 to 20 loads of cinders in the cowlot or the lack of them means the success or failure of a mastitis control program. The following eight-point program for the control of mastitis is recommended:

1. Prevention should begin with the calf. Feed the calf on pasteurized milk or heated milk and permit no self-sucking or sucking of other calves.

2. When heifers come into milk always place them at the head of the milk line.

3. Bacteriological and strip cup testing should be applied frequently.

4. Cows once classified as having mastitis should not be reclassified, as many of them may still be dangerous.

5. Complete hand milking is recommended in infected herds.

6. Superphosphate may be used for disinfecting cattle runs and stalls.

7. Chlorine, 250ppm, should be used for washing the teats before and after milking. A chlorine solution of the same strength should be used for dipping the cups of the milking machine when the milking of each cow is completed.

8. Eliminate the reactors to the brucellosis test and test thereafter at frequent intervals.

Reminiscences II

By NELSON S. MAYO
Mount Dora, Florida

WHEN I went to Kansas State in 1890 I was supposed to teach human physiology and give lectures on veterinary science, but as I was the "kid" member of the faculty, I was also expected to teach all other subjects that other faculty members did not want. As a result I was given zoology and geology, was made curator of the college museum and later director of athletics. It surely kept me hopping to keep one jump, let alone two, ahead of the students many of whom were older than I. In fact, I was frequently mistaken for a student —sometimes even for a freshman—to the joy of the student body.

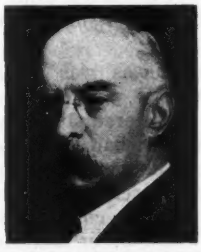
There had been a veterinarian at Kansas State before I went there but he was gone, so I really started the veterinary department there. It is said that the young dream dreams, but I never dreamed that the department would develop into the excellent veterinary college they now have there.

As veterinarian to the experiment station I was expected to do research work on animal diseases. There was a wide field "ripe for the harvest," but I didn't gather a very large crop.

In the middle west there were only a few men engaged in veterinary research at that time—Dr. M. Stalker of Ames, Iowa; Dr. Frank Billings of Nebraska, who lasted only a year or two and was succeeded by Dr. A. T. Peters, Dr. George H. Glover of Colorado and I think Hopkins was a sort of state veterinarian in Wyoming but I do not recall having met him. Hopkins had been active in prodding the Wyoming Cattle Growers' Association to help establish the United States Bureau of Animal Industry. To the south was Dr. Mark Francis of Texas; Dr. Paul Paquin, state veterinarian of Missouri; Dr. R. R. Dinwiddie of Arkansas, and Dr. W. H. Dalrymple of the Louisiana Agricultural Experiment Station. All were interested in research. Doctor Dinwiddie wrote a book on bacteriology when this science was in its infancy.

About this time Smith and Kilborne announced their discovery—that the cattle tick is the vector of Texas fever. Doctor Francis was located in a tick infested region, so he suggested we test the "theory." He sent me a batch of tick eggs by mail and when they hatched I put the young ticks on a couple of small calves, without untoward results. Francis then wrote that young calves have a great deal of natural immunity to tick fever and sent me another lot of eggs. I was such a heretic, that I let about 40 young ticks crawl onto *my* Jersey cow. When the autopsy showed typical lesions of Texas fever, I was *really* converted. In this connection the doctor told me that some newspaper printed a story that he (Francis) had discovered a plan for electrocuting cattle ticks by giving a steer an electric shock. Francis said the plan was new to him, but he was willing to try it. He consulted the electrical experts at the college and they suggested a current of 110 volts. So he tied up a ticky steer, fastened one wire to his head and another to the steer's tail and turned on the "juice." The steer gave one jump and dropped dead. Francis said it was a fine experiment for he found out how much electricity would kill a steer.

Another experiment is still bright in my memory. Doctor Paquin of Missouri thought he had found a treatment for hog cholera. This disease, like the poor, is always with us. He sent me the formula—I remember only one ingredient, salol. I mixed up a lot and



WILLIAM HADDOCK DALRYMPLE, M.R.C.V.S.
Doctor Dalrymple went to Louisiana in the '90's and contributed largely to agricultural progress in the deep South

sent some to a farmer who had appealed for help. He didn't report the results then. Later I went to a farmers' institute to give a talk on hog cholera. This particular farmer was present and when I finished he got up to give his testimony. He was an Irishman with a delightful brogue—but not to me! He told how the distinguished professor from the great college sent him the cholera cure. He took a sick pig, held it by an ear and poured the medicine down the pig's throat. The pig gave a few hiccups, rolled his eyes, kicked four times and died. He treated several more—same result with all. He said my wonderful remedy really did stop every case of cholera he tried it on. A hilarious time was had by all present, except myself, and I even managed to squeeze out a few "dry grins."

Shortly before this time Professor Burrell, of the University of Illinois, had announced

the discovery of an organism that caused red or rusty spots on cornstalks. This was known as the Burrell bacterial corn disease. Doctor Billings claimed this organism was the cause of cornstalk disease of cattle so I went to work on this project. I inoculated lots of cornstalks and fed them to cattle. I also drenched cattle with pints of cultured bacteria without unfavorable symptoms and then published the results. Years later Dr. V. A. Moore told me that soon after this publication, some foreign government (Germany I think) proposed to exclude the importation of live American cattle because of cornstalk disease in this country, but on the showing of my publication it was not enforced.

In the early ninety's the B.A.I. permitted the shipment of tick infested southern cattle to northern markets for immediate slaughter. These cattle were shipped in cars marked "Southern Cattle" and were unloaded into quarantine pens. In the vicinity of the large markets in eastern Kansas these southern cars were cleaned, or the litter worked out in transit. Cows pasturing on the railroad right-of-way, sometimes contracted what was known as "town cow disease" or, more correctly, Texas fever.

Bovine tuberculosis was becoming of increasing importance, particularly among purebred cattle. A registered shorthorn cow in the college herd was in bad condition from what I diagnosed as tuberculosis. The professor of agriculture was foreign born and he asked me if I had ever seen contagious pleuropneumonia. I told him I never had. He said he had seen it in Europe and was sure this cow had it. He was present at the autopsy and when the lungs were removed with masses of tubercules and also a large abscess which I slit open and from which a quart of pus escaped, between gags and retches the professor said to the farm foreman, "Sell her calf to the butcher."

While glanders was not a serious problem, a few cases were encountered. The State did not allow compensation for glandered horses and we could not legally destroy them without the owner's consent. The infected animals and premises were quarantined and in a number of instances real hardship to some poor farmers resulted. I was called by the sheriff of a western county to investigate reported glanders. There was a non-graduate practitioner in the town, who wanted to take me out to the farm and he came to the hotel to get me, with a nice pair of driving horses. One was slightly lame and, when comment was made, the "Doctor" said it had sprained its fetlock in the barnyard. With his permission examination of the foot was made. On removing a nail the "sprain" was relieved. When we reached the farm he drove his team under a shed. I examined the horses and used an electric flashlight to look into the nostrils. This was a novelty to the "doctor" and when both horses were found to have typical cases of glanders the doctor fairly flew to the shed to get his team away.

One time I was called to the "short grass" country where a stockman was to meet me at the railway. When the conductor looked at my pass and I told him my station he said, "It's a big town." As it was a flag station on a branch line, he told me its size, which was "five hundred but they are all prairie dogs." He was right. There was nothing but a stockpen and a loading chute and no one to meet me. After waiting for some time I saw a cowboy on a horse half a mile away and attracted his attention. He agreed to take me six miles to the ranch. He gave me the saddled horse and he rode bareback. When we got to the ranch inquiry was made as to how much I owed him. He said "25 cents." I explained to him the state paid my expenses and insisted on paying him more. He accepted reluctantly because he said, "I've had a good time. I don't see anyone out here very often."

About 1895 I was called to investigate a disease of cattle in southwestern Kansas. The ranch was located on the old Fort Larned military reservation. This had been an old frontier post, located where the Santa Fe Trail crossed the Pawnee River. The military post had been abandoned, but many of the buildings remained. The ranchman lived in what had been the commanding officer's quarters. The other buildings, which had formed a quadrangle around the parade ground, were used as sheds. There was a cemetery, but when the post was abandoned the soldiers' bodies had been removed. However, quite a number of graves of civilians remained. Most of the headstones had been pushed down by the cattle rubbing against them. The inscriptions on the tombstones revealed there had been an outbreak of cholera at this post in 1867.

The disease affecting the cattle was mange, the first cases I had ever seen. I published a bulletin on this disease that I think was the first published report on mange in cattle in this country—at least I could find no reference to a previous report. This disease was known to Kansas cattlemen as "Texas itch" and I was told in Texas it was called "Mexican itch." What the Mexicans called it I don't know.

(To be continued)

An Unusual Case of Genital Involvement in Swine

Associated with Eating Moldy Corn

By J. S. KOEN*
Storm Lake, Iowa
and H. C. SMITH†
Sioux City, Iowa

SEPTEMBER 14, 1944, we were called in consultation by Frank Bonstetter, Garner, Ia., to observe an unusual condition in a herd of 106 Chester White, spring pigs, weighing from 90 to 135 pounds; the property of the Hancock County Farm.

The farm is well situated in a highly fertile farming area in Northern Iowa. The buildings are well constructed and drainage is away from them. The animals involved were from good, clean Chester White sows and from a purebred boar.

The usual crops of alfalfa hay, corn and oats are grown on the place as is also a large garden for the use of the personnel. A large herd of Holstein-Fresian cattle is maintained, but the cattle are not allowed to run in the same pasture as the swine. There was nothing in the pastures which would indicate a poisonous weed or plant or growth of any kind.

Review of the Literature

Buxton[1] described an outbreak of this disease in which 28 gilts were affected and all died. In a second occurrence in which 58 gilts were affected the feed was changed on the recommendation of Doctor Kinsley and all recovered. McNutt[2] discussing the same condition, stated that he had observed it in gilts that were being fed moldy corn and had produced it experimentally by feeding moldy corn. All attempts to communicate the disease from affected to non-affected animals failed and the conclusion was reached that it is not infectious.

Legenhausen[3] reported having seen the condition in two herds in which both gilts and boars were affected. In the former swelling and eversion of the vagina progressed until the os uteri was visible. In the male there was swelling of the prepuce. Legenhausen's appears to be the only report in the literature that tells of an incidence of the disease in males comparable to that in gilts. McNutt[4] mentions occasional cases of swelling of the prepuce in affected herds but questions that it is etiologically related to the anovaginitis of the gilts. No previous observation of the mastitis in males, which was such an outstanding symptom in the outbreak here reported, appears to have been mentioned.

McNutt,[4] et al., described a condition, in swine affecting the external gentalia, occurring in the late fall of the year 1927. The condition no doubt was rather wide spread in corn and swine growing areas that season.

These authors describe this condition as a vulvovaginitis, the inflammation of the vulva being primary with an extension into the vagina. In males a sporadic, mild, non-specific inflammation of the prepuce is noticed, there being no apparent discharge from either the vulva or the prepuce. Attempts were made to transmit this condition to healthy normal animals by contact, also by using vaginal washings from affected animals. These experiments resulted in negative findings.

These workers with the aid of Dr. J. T. Gilloon of Dyersville, Iowa, were the first to incriminate corn as the possible cause of this condition. A sample of moldy corn fed to experimental normal gilts produced a similar condition in six days. They concluded that

Cattle were not allowed to run in the same pasture with the swine

*J. S. Koen, U. S. Bureau of Animal Industry.
†H. C. Smith, Allied Laboratories, Inc.

vulvovaginitis in gilts is apparently due to feeding spoiled corn, but that it cannot be said definitely that mold is responsible for the poisonous properties that develop.

McNutt[5] further describes a condition affecting cattle as necrotic vulvitis which manifests itself as the term indicates. This condition occurs usually in feed lot cattle or heifers being fattened for market. The vulva appears first as greatly swollen and inflammed and progresses to necrosis, perhaps as a result of the impaired circulation. It is suggested that

Two views of a case of vaginitis in a gilt

swine, which commonly follow cattle on feed in the corn belt, by biting the parts are the main factor in causing the disease.

Derrer[6] reported outbreaks of anovulvitis of cattle as occurring in the vicinity of Mt. Carroll, Illinois, in which the *Actinomyces necrophorus* was concluded to be the specific cause. He describes an outbreak in 40 of 60 heifers in three feed lots. The condition did not spread to any of the other lots on the premises, which contained a total of 1,200 animals, although all lots contained hogs. The following year the condition reappeared in the same feed lots, in a different group of animals. Of 450 cows, 312 were affected.

Mitchell,[7] *et al.*, report on attempts to determine the cause of vaginitis of cattle. Experiments disproved the theory that this condition was due to a filterable virus. Cultures taken from the vagina of affected animals produced a growth of streptococcus organisms, however, attempts to reproduce the disease by the use of this organism failed. They were successful in reproducing the disease in two of six animals by injection, into the vaginal mucosa, of a leptothrix organism which they had previously isolated.

History of the Outbreak

The entire herd of shotes, both males and females, were affected at the time of our observation. They had been weaned at eight to 10 weeks of age. The old sows had been removed from the young animals and placed in a fattening pen in preparation for sale. They were not involved in this outbreak.

As soon as the young swine were weaned and placed on their own feed, the manager noticed swelling of the vulva of the females and enlargement of the prepuce and teats of the males. This condition progressed gradually until a week before our visit, at which time it was very pronounced. Five of these animals had developed an eversion of the vagina; two being in such bad condition that it was necessary to destroy them.

Feeding Practice

The feed consisted of yellow hybrid corn grown the preceding year (1943), supplements and blue grass pasture. The animals had free access to water by means of a fountain. The supplements were fed in a selffeeder. The corn was thrown onto a good solid concrete floor which was kept reasonably clean. The double crib in which the corn was stored was well constructed and in good repair; having a solid concrete floor. However, the corn in the crib, particularly that in the middle was extensively moldy. Not only were the kernels moldy, but the corn cob also was moldy. Upon breaking an ear, one could observe that the mold extended into the pith of the cob.

This corn was fed to the pigs from the time they were weaned. As they grew and consumed more of it, the unusual condition described, also progressed.

Symptoms in the Gilts

There was a pronounced enlargement of the vulva which appeared to be red and swollen; the organs in many animals gaping wide open. The redness was most noticeable, due in part to the pigs being white. The manager at first thought that the pigs were coming into estrus young as they were. For this reason he did not call for veterinary service until prolapse of the vagina had actually occurred, at which time he became alarmed.

In the more advanced cases which involved the larger and perhaps the older gilts, the

swelling of vulva and vagina progressed to actual necrosis of the mucosa. The swollen mass in these animals protruded four to five inches. At no time did the caretakers notice any biting of the affected parts by any other members of the herd. Therefore mechanical injury was ruled out as a cause of the clinical symptoms. The mammary glands and teats of the gilts were not noticeably involved and appeared to be normal.

Symptoms in the Barrows

All of the boar pigs had been castrated at weaning time and were allowed to run with the gilts. In the barrows there was enlargement of the prepuce to two to three times the normal size. This swelling did not appear to affect the act of urination. The outstanding symptom however was the enlargement of the mammary glands and the extreme enlargement and redness of the teats. Regardless of the age of the barrow, the glands appeared to be developing to the extent that they were going to secrete milk. There was nothing to indicate that this swelling was a result of mechanical injury; all of the mammary glands on the male pigs being involved.

Recommendation

Because from our observation in the herd and of the corn, we concluded that the genital involvement in the pigs must be the result of the feeding of moldy corn. Therefore it was recommended that no more of this corn be fed to the pigs.

These recommendations were followed with the result that a month later a great improvement was shown by all of the pigs, except the worst two cases that were killed. Corn free from mold was purchased and fed. The switch to corn that was not moldy was the only change made in the diet and no treatment was given the ailing swine.

Two months later many of the pigs were apparently normal. A few of the gilts, that were most severely attacked, still showed some enlargement of the vulva. The barrow pigs had recovered from most of the enlargement of the mammary glands. Three months later the entire herd appeared to have completely recovered. Twenty of these recovered gilts were selected for breeding, which was started December 15. These gilts will be kept under observation until they farrow to determine what effect, if any, the condition has on the breeding efficiency.

Because of the enlargement of the vulva in the immature gilts and the enlargement of the prepuce and all of the mammary glands and teats in the barrows, it is suggested that the moldy corn may contain some chemical agent such as stilbestrol or ergot which may be responsible for these symptoms. There is a possibility that the mold may be responsible for a breakdown of some of the constituents of the corn and may be cumulative in action.

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More and Bigger Locker Plants

Five thousand frozen food locker-plant operators were questioned by the Edison General Electric Appliance Company as to their after-the-war plans. The questionnaire was returned by 1154 plant operators. Of these 73.8% plan to expand their retail sales post-war, and 18.1% expect to establish scheduled truck delivery routes in their cities and nearby communities; i.e., their business will not be confined to the few hundred who rent lockers but will be extended to a far larger number of retail customers. Locker plants are already a factor in the slaughter of meat animals. The prospects seem to indicate they are destined to become a much larger factor and perhaps become the major outlet for uninspected meats.

Preservative for Calcium Gluconate Solutions

According to Greig, a solution of calcium for intravenous or subcutaneous use in the treatment of milk fever in cows should be prepared by using one dram (4gm) of boric acid to the ounce (30gm) of calcium gluconate. If the solution is not for immediate use a preservative should be added since the calcium borogluconate solution supports mold growth. A satisfactory preservative is two drops to the ounce of a 33⅓% solution of thymol in alcohol.

The dose of calcium borogluconate required to affect a cure in milk fever varies in different localities and under differing circumstances. Probably about 100gm (435cc of a 23% solution, 333cc of a 30% solution, etc.) should be regarded as the minimum dose for the average case.

★★★ BUY WAR BONDS ★★★
AND HOLD THEM

Topical Application of Sulfanilamide

By J. LaVERE DAVIDSON, Lt. Col., V.C.
Sioux Falls Army Air Field,
Sioux Falls, South Dakota

THE local application of sulfonamides has received much attention in the past few years. With the growth in our knowledge of the topical use of these drugs has come new and better methods of administration.

It is gratifying that the first use of sulfanilamide, as a wound application, other than as an experiment, was by veterinarians. This was in 1941, during Army maneuvers in Louisiana. It was so employed in approximately a thousand accidental and surgical wounds with highly satisfactory results. It was several weeks later that the local use of sulfanilamide in wound treatment by Army and Navy doctors at Pearl Harbor brought about its general adoption by the medical profession.

While the envelope and the shaker-top type of container have been useful in certain types of lesions, neither is satisfactory for applying the powder to the more or less inaccessible areas of some wounds. For this purpose insufflation or blowing the powder into a cavity or in and about the lesion has often been found to be more efficient. It has been found that a small circular bellows type container has accomplished this insufflation of sulfanilamide powder very satisfactorily, the powder being ejected as a fine spray so that a thin application or a frosting of the wound is obtained.

Absorption of Sulfanilamide.—When sulfanilamide is placed in a wound appreciable absorption occurs into the blood stream. The resulting blood levels are usually not high enough to cause toxic manifestation, but if the drug is applied heavily to a large surface or in the peritoneal cavity, toxic effects may, occasionally, occur. Hawking[1] studied the action of sulfonamides in tissue application. Variability in absorption was noted, with sulfanilamide the most rapidly absorbed; then sulfathiazole and last sulfapyridine. Hawking gives his opinion on the relative value of sulfanilamide as compared to other sulfanomides in the following statement: "The best compound to use is sulfanilamide. It is cheaper and has a high local concentration, greater power of concentration and diffusibility."

Action of Sulfanilamide Following Application.—The pharmacologic action of sulfonamides is generally considered to be bacteriostatic but may be germicidal in sites where the drug has attained a high concentration. The therapeutic effect may vary in accordance with the antagonistic substances present in the organisms or the surrounding tissues. It has been noted that sulfonamides are inhibited by the presence of yeast and bacterial extracts, peptones, and substances of similar nature (such as para-aminobenzoic acid) as well as pus. This emphasizes the need of complete cleanliness and débridement to prevent formation of inhibiting substances from cellular decomposition. Sulfonamides, unlike other antiseptic agents, have a prolonged action on practically all bacteria and are able to maintain this effect for many hours after application. This action is chiefly dependent upon two factors: First, the concentration of the drug in contact with the organisms; second, the amount of free peptones and other sulfonamide-inhibiting substances present. Therefore, the best results are obtained by proper preparation of the wound. Most pyogenic wounds, if free from débris and adequately drained, become practically sterile after three or four days of powdered sulfanilamide applications.

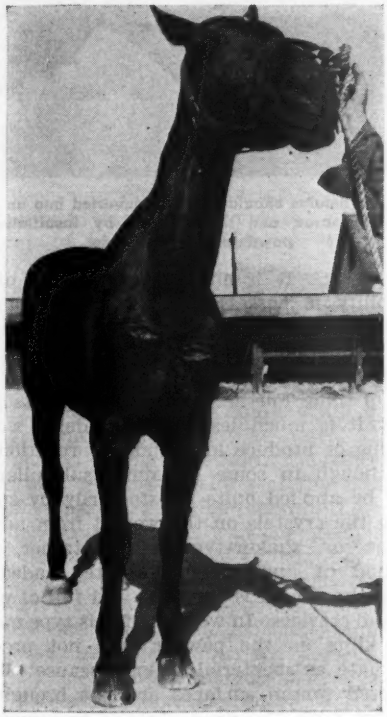
Wound Healing vs. Sulfanilamide.—The effect of sulfanilamide on wound healing and tissues has been a controversial subject. Some believe there is no interference with wound healing, that there is no hindrance to leucocyte infiltration and the formation of granulation tissue. Retarded healing has been reported by others. Klepser,[2] in a study of biopsies from 70 infected wounds, found that in no instance was there gross or microscopic evidence of sulfanilamide interfering with the normal healing processes. Furthermore, he found no evidence that sulfanilamide destroys fibroblasts or epithelium. This conforms to the experience of Campbell[3] in the treatment of wounds in several hundred army horses.

It may be concluded from the evidence available that local toxic action on tissues is dependent upon the sulfa drug employed and the amount implanted. Relatively insoluble drugs are more likely to delay wound healing and produce inflammatory reactions; hence sulfanilamide is the drug of choice over sulfapyridine, sulfathiazole or sulfadiazine in this respect.

Uses of Powdered Sulfanilamide.—The topical application of sulfanilamide is a clinically accepted procedure of proved therapeutic value. It has been employed successfully as a prophylactic against infection in both clean, operative and presumably contaminated trau-

matic wounds, as an adjunct in treatment of mucous membrane infections and certain skin diseases. The following specific recommendations are given as examples of the local use of sulfanilamide in a number of typical conditions. From these, application to other conditions should be obvious.

Traumatic Surgery.—In conditions of this type careful surgical technic should be employed in an attempt to remove foreign material, necrotic tissue and exudate. If the animal patient is febrile and the infection extensive, oral administration of sulfa drugs may be indicated. In lesions of this type administration of sulfanilamide topically by insufflation may be indicated. Certain parts of the wound may be covered adequately by sifting the crystals of sulfanilamide from an envelope.



Topical application of sulfanilamide has often been used successfully as a wound dressing; for example, wire cuts as here illustrated

Penetrating Wounds.—Wounds of this type should be irrigated with saline saturated with sulfanilamide, then "frosted" with sulfanilamide. Insufflation of the powder in all cavities and crevices of the wound is necessary. If wounds are more than an hour old or grossly contaminated, sulfonamide by mouth also may be indicated. In conditions of this nature care should be exerted to remove foreign material, necrotic tissue and exudate preliminary to local application of sulfanilamide. The importance was stressed in a report[4] of the 30th Veterinary General Hospital.

Use Intraperitoneally.—Sulfanilamide has been used extensively in the prophylaxis and treatment of peritoneal infections. When used in this manner the possibility of toxic manifestations must be kept in mind, as sulfanilamide is rapidly absorbed from the peritoneal cavity. Appropriate drainage of course should be instituted. The author has found that 1gm per 15 pounds of body weight may be administered intraperitoneally without fear of toxicity. In the use of sulfanilamide in the 30th Veterinary General Hospital, the most extensive use of this drug in animals so far reported, the dosage employed was one grain of sulfanilamide per pound of body weight at the first dose and thereafter one-third grain per pound of body weight every eight hours for 48 to 72 hours, after which period the dose was reduced to one-half this amount.

Infected Burns.—The same principles are involved in treating infected burns as for the treatment of infected wounds. For local therapy sulfanilamide crystals may be "frosted" over the area by insufflation. The application is simple and relatively painless. It should be remembered that toxicity may follow if the application is over a large surface.

Lesions of Skin and Subcutaneous Tissue.—The local application of sulfanilamide is useful in the treatment of many skin conditions, especially where streptococci are involved as secondary invaders. Chronic ulcers of various types may sometimes be treated successfully by the local application of powdered sulfanilamide. Application by insufflation usually is the preferred method of administration.

Ear, Nose and Throat Diseases.—For prophylaxis after operative procedures, sulfanilamide may be blown or insufflated on the site of the operation. In pyogenic infection of the auditory canal the local application of sulfanilamide is indicated, and if otitis media does not respond to oral sulfonamide therapy and surgery, a small amount of sulfanilamide powder may help materially. For *beta* hemolytic streptococcic pharyngitis sulfanilamide powder may be blown into the inflamed area at intervals.

Obstetrics.—For puerperal postabortal infections adequate blood levels of sulfonamide drug are indicated. Some veterinarians recommend gentle irrigation of the uterine cavity by gravity using saline saturated with sulfanilamide, the author has found this of benefit

in large animal obstetrics but in small animals it is preferable to blow sulfanilamide powder into the uterine cavity by means of an insufflator.

Advantage of Insufflation.—The type of wound to some extent limits the effectiveness of local application. Deep pocketed wounds and inaccessible walled off abscesses or drainage fistulas cannot be benefited unless the wound is first converted into an open accessible area by débridement and drainage. Then it is necessary to get the drug in contact with all surfaces of the wound. This may be accomplished by insufflation or blowing the powder over and into the affected area. Even after applying the drug by insufflation there may be a limited diffusion into surrounding tissues. For this reason sulfanilamide, which is the most diffusible and readily absorbed of the current sulfonamides, is preferred by the writer to the other drugs.

Goal of Therapy.—The main reason for applying sulfanilamide locally is to attain an effective concentration of the drug at the infected site. Such a concentration is usually obtained in a shorter period of time than can be obtained following oral or parenteral administration. Furthermore, it is hoped to reach a therapeutic concentration without absorption and attainment of a general body level. The absorption, if any, depends on the concentration of the drug at the local site, on whether the skin is intact or broken and on the relative rate of absorption of the particular drug used. Usually absorption into the blood stream is insignificant for, even with local tissue concentration of 800mg per cent, systemic concentrations usually do not exceed 2 or 3mg per 100cc of blood.

Reactions.—General toxic manifestations from the local use of sulfonamides rarely occur; however, reactions do occur and the possibility of such reactions must be recognized. Occasionally from fresh burns or from repeated applications absorption is great enough to give a blood concentration of the drug which may produce toxic systemic symptoms. Several instances of transient jaundice following application of powdered sulfonamides into the peritoneal cavity have been reported. A number of other divergent causes have been cited, including individual intolerance to sulfanilamide. Such hypersensitivity, however, may be noted with any drug and is not a problem, disappearing when the offending drug is withdrawn.

Summary and Conclusions.—The topical application of sulfanilamide has been employed successfully as a prophylactic against infection in many types of conditions, including traumatic wounds, burns and various lesions of the skin and subcutaneous tissue. More recently it has been found useful in the treatment of certain conditions of the ear, nose and throat. Sulfanilamide is usually the choice for local

Draining fistulas should first be converted into an open accessible area and then treated by insufflation of powdered sulfanilamide

application. It is cheap, and because of its solubility it possesses a greater diffusibility than do other common sulfonamides. Because of its solubility a high local concentration can be reached and in a comparatively short period of time. Furthermore, because of its solubility it is much less likely to delay wound healing or produce inflammatory reactions.

Although in some instances sulfanilamide may be applied quite satisfactorily by sprinkling the crystals on the wound from an envelope or shaker-type of container, this method of application is quite inadequate when the wound is irregular and full of pockets and crevices. In wounds of this type merely sprinkling on the powder does not produce adequate antibacterial action because all the infected wound surfaces are not brought in contact with the drug. In the treatment of wounds containing these more or less inaccessible areas, insufflation, or blowing the drug in and around the lesion, is preferred by the writer.

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★★★ BUY WAR BONDS ★★★
AND HOLD THEM

A Practitioner's View of Respiratory Diseases of Adult Fowls*

By WARREN E. BOWSTEAD
Lowden, Iowa

RESPIRATORY disease of fowls becomes a more complex picture daily as new etiological factors are discovered. In this presentation the aim is to present only the fundamentals of each of the more common conditions as the general practitioner meets them in Eastern Iowa. It is not necessary to say that I am in no sense a poultry expert.

The entities to be considered consist of:

1. Vitamin A deficiency
2. Coryza
3. Fowl pox
4. Infectious laryngotracheitis
5. Infectious bronchitis

Vitamin A Deficiency

A lack of vitamin A may be either the primary or a predisposing factor in respiratory ailments in fowl. Vitamin A has often been spoken of as the anti-infective vitamin. It aids in maintaining the physiologic integrity of epithelial tissue which is the first line of defense against invading forces.

The preclinical picture of vitamin A deficiency may consist of a lack of vigor, emaciation and roughened plumage. Later, a watery lacrimal discharge and chalk white caseous material in the eyes may be noted. The accumulation of this material in the sinuses and cleft palate causes swelling of the face. Unattached particles may be found in the mouth. If they accumulate only in the trachea they may be mistaken for the exhudate of laryngotracheitis, but generally they may be found also in the pharynx, esophagus and crop in pustule-like lesions. The morbidity and mortality are dependent upon the degree of deficiency, the duration thereof, and the secondary infections which may ensue.

We have become increasingly aware that vitamin A is not too stable. Though fish oil carriers, dehydrated alfalfa leaf meal and yellow corn may be incorporated in poultry mashes at the time of mixing, age and high atmospheric temperatures may impair or even destroy this factor in them. The degree of bleaching of feeds is not a safe guide to the amount of carotene or vitamin A which they contain or lack. Many of the fish oil products and carriers have been reduced in A content. Some commercial mashes are now fortified only with Vitamin D. In applying therapeutic measures we should supply an amount above the normal requirements.

*Presented at a meeting of the East Central Iowa Veterinary Society, Cedar Rapids, Iowa, Jan. 11, 1945.

Coryza

This condition is seen most frequently of all the respiratory diseases. Several organisms have been incriminated, among them *Hemophilus gallinarum*. The slight nasal discharge first noted may progress to edema of the face and wattles, sinusitis, tracheitis, bronchitis, and pneumonia. The severity is in proportion to the organs involved. When the trachea and lungs are involved it may simulate infectious laryngotracheitis, and many of the birds may die of asphyxiation. The odor of coryza is

Fig. 1. Edema of the face, comb and wattles resulting from coryza

quite characteristic as is also involvement of the nose and eye. The loss of production is as serious as the mortality or more so. The period of recovery may be extended.

Fowl Pox

Fowl pox was probably one of the earliest diseases of poultry to be recorded in the literature. Many names and classifications have been applied according to the area attacked. Thus we find "canker," "diphtheria" and "contagious epithelioma" all produced by the same dermotropic virus.

The lesions may consists of epitheliomas on the comb, wattles, eyelids, or at the corners of the mouth. In addition there may be diphtheritic lesions of the mouth, pharynx, larynx, trachea or intestinal tract. The sinuses or eye may be affected. Any one or all of these lesions may occur in the same flock or even in the same bird at the same time. The diagnosis is not difficult providing a variety of the lesions

occur in the same flock. The diphtheritic lesions alone may be mistaken for laryngotracheitis or coryza. Unless control measures are adopted early, the mortality in fowl pox is apt to be heavy and the course extended. Loss of production in layers is serious.

Laryngotracheitis

This disease, as it is now known, is of comparatively recent vintage. It too is caused by a virus. Generally the course is quite typical. The onset is sudden and it spreads rapidly.

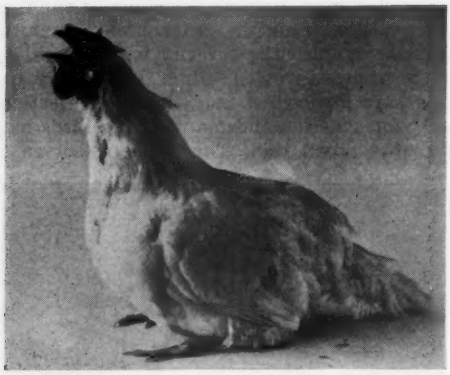

Fig. 2. Infectious laryngotracheitis; attitude during inspiration

The affected bird is acutely ill. It extends its head and neck upon inspiration. Rattling or whistling sounds are common upon expiration. The picture is one of extreme depression. The comb is apt to be cyanotic. Examination of the larynx and trachea generally reveals hemorrhagic or croupous exudate. Rarely is the nose or eye affected. Rare too is the characteristic odor of true coryza. The mortality may be as high as 90%.

Infectious Bronchitis

This condition is still subject to some controversy, though it is known to be caused by a virus. Since this discussion includes only adult fowl it suffices to say that it is a disease characterized by coughing and gasping; that autopsy shows it to be limited to the lower trachea, bronchi and lungs. The exhudate is clear or turbid but not hemorrhagic. The loss in adult birds is not often high.

Treatment of Fowl

Treatment of any of the respiratory diseases must be preceded by proper husbandry if satisfactory results are to be obtained. Most poultry houses are greatly overcrowded at the present time. When a house is filled only to its normal capacity an antiquated ventilating system may suffice, yet fail utterly under overcrowding. The litter becomes damp, the feeders are crowded, the water supply is insufficient or polluted, and trouble begins. Internal and external parasites may play a very real part in predisposing birds to respiratory diseases and to the spread of these diseases. The danger from the recovered carrier cannot be overemphasized. If housed together, old hens, recovered from a disease the previous season, are seed stock for the pullets. The dirty catching crate or seed sack may spread disease from farm to farm. We veterinarians should set an example by cleaning our footwear and changing our outer garments after visiting a diseased flock.

In no case are we going to be able to correct all the faults in husbandry at a single visit to the ailing flock. At least, a visit to the farm does permit us to suggest needed changes. Frequently the single bird presented at the office for autopsy is not characteristic of the flock.

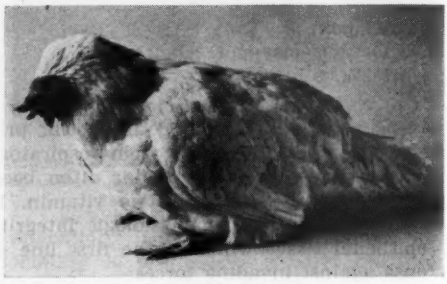

Fig. 3. Infectious laryngotracheitis; attitude during expiration

Sprays used over the birds on the roost are beneficial in coryza or bronchitis. They are probably detrimental in cases of fowl pox or laryngotracheitis. Sulfathiazole, administered in the mash, has been highly recommended for use in cases of coryza. Pigeon pox vaccine may be of value in the laying flock in the early stages of fowl pox. In laryngotracheitis the onset is generally so sudden that all birds in one pen at least, if not the whole farm, are affected before the flock owner becomes alarmed. In the early stages, the use of laryngotracheitis vaccine in unaffected pens may be of value but its use when a definite diagnosis has not been made is to be condemned.

In any respiratory disease nursing plays a very great part. The provision of soft, appetizing foods, such wet mashes, fed often and in small amounts, may increase the intake of nutrients. Skim milk is valuable, providing it is fed in a sanitary manner. A leading poultry pathologist has often made the statement that more sick birds starve to death than die of disease.

Observations on Canine Leptospirosis in Antigua

By L. R. HUTSON*
Antigua, British West Indies

LEPTOSPIRA infection in dogs is fairly widespread geographically, having been reported from England, Holland, the United States and other countries. Clinicians are inclining to the opinion that this disease has greater incidence than is supposed and this supposition is strengthened by the fact that since the symptoms simulate other diseases such as distemper, blacktongue and catarrhal jaundice, the true nature of leptospirosis may be masked and be unrecognized.

The purpose of this paper is to record the initial incidence of this disease amongst dogs in the island of Antigua, B. W. I., based on clinical symptoms, post-mortem findings and the serological response to the canicola type of organism. There are no definite reports of this disease in other areas of the Caribbean with the exception of one from Puerto Rico, where Betzold[1] cites a case in which the organisms (strain not stated) were demonstrated in kidney sections following death.

The disease first made its appearance in the island of Antigua in January to March, 1943, when several cases were observed. A recurrence of cases was also observed at or about the same time during 1944. The seasonal incidence in California, as stated by Meyer,[2] *et al.*, was the highest during the months of May and July and again in November-December. With regard to the sex distribution and age incidence, the local findings are practically the same as those of the above workers; no clinical cases were observed in females and all the cases were in adult male dogs with the exception of one in a four-month-old puppy.

A noticeable feature in these outbreaks was the liability of infection to become established in a home or area and to flare up again after variable periods of quiessence, when dog replacements were introduced.

Clinical cases observed were both of the icteric and the hemorrhagic or anicteric types, with several cases showing a combination of both forms. From one of the cases it was possible to obtain a blood specimen suitable for making a serological test, and this gave a titer of 1:10, 1:100, 1:1000 to the canicola type of organism when using a standard bi-valent antigen.** It was also possible to carry out a few post-mortem examinations where the findings were typical of those reported by other workers.

The treatment of several cases was very unsuccessful. It consisted of general supportive measures in addition to the use of specific bi-valent antiserum. It would appear from my observations that antiserum is of no value after the symptoms of icterus, however mild, are visible. However, in fairness to this product, it should be stated that there was no opportunity to use it in the early stages of the infection, when different results might have been obtained.

It was decided to conduct some experiments with regard to active immunization in view of the work reported by Alicata[3] who carried out limited experiments of this nature using a formalized leptospira antigen. He concluded from these tests that immunity followed the inoculation but no attempts were made to determine how long such immunity was maintained. At the request of the writer, Lederle Laboratories prepared a bivalent formalized antigen for experimental use and suggested two subcutaneous injections of 2cc each at seven-day intervals. Twenty-five dogs were selected for this experiment, including both males and females of adult age and puppies over four months of age. The dogs were drawn from areas where no cases had been previously observed, except in two instances. In view of the absence of leptospira infection amongst the dog population of the island previous to the initial incidence in January, 1943, it was not considered that any noticeable percentage of dogs would be carrying a blood titer to leptospirosis and, consequently, no prevaccination agglutination tests were carried out, with the exception of two suspected cases, which were both negative.

Following the series of injections at seven-day intervals, no systemic reactions were noticed with the exception of a variable local reaction at the site of inoculation. A limited number of post-vaccination blood tests (five, including the two negative to pre-vaccination) were made three weeks after the last injection. A titer response was forthcoming from all five in dilutions of 1:10, 1:100, 1:1000

*Chief Veterinary Officer, Leeward Isles, B. W. I.

**The author is indebted to Lederle Laboratories, Pearl River, N. Y., for complimentary supplies of test antigen and for the special preparation of the vaccine, mentioned later, for experimental use.

to both *L. canicola* and *L. icterohaemorrhagiae*.

From this number of vaccinated dogs, two died from clinical leptospirosis showing definite symptoms of the hemorrhagic type. The following are the case reports on these dogs:

Dog No. 1.—Mongrel adult dog, approximately one year of age. Pre-vaccination agglutination titer, negative, using a standard bivalent antigen. First and second injections were given Feb. 26 and March 4, 1944. The post-vaccination titer was positive for both strains, 1:10, 1:100, 1:1000. The animal died on May 6, 1944 or 63 days following the second injection, with typical symptoms of leptospirosis, hemorrhagic type.

More than 10% of rats are infected with leptospirosis. The leptospirae is passed with the urine

There were two rather interesting features of this case. (1) There was a fatal case, icteric type, in this home about six months previously. Dog No. 1 was brought in about three months after the death of the previous one. (2) Another dog, unvaccinated, was brought into this home about one month after Dog No. 1. It died at the same time, also showing similar symptoms of leptospirosis. The interesting feature connected with these two cases was that about 7 to 10 days previous to their deaths, both of these dogs had mated with a wandering bitch which was in heat. This raises a suspicion as to the possibility of infection being conveyed through the sexual act by a carrier female. If so, this may account for the seasonal incidence of the disease, related to the periodicity of the estral cycle in the bitch. In a small island like Antigua, this means of spread could also account for the simultaneous occurrence of widely separated cases, bearing in mind the wandering disposition of a bitch in estrum as well as her almost irresistible attraction for male dogs. Enlarging on the hypothesis that a carrier bitch may spread the infection, this would be possible in two ways. (1) Through actual sexual contact and (2) through organisms shed in infected urine, which normally holds great attraction for male dogs.

Dog No. 2.—This dog, a mongrel of about two years of age, was also located in a home where there had been a previous death from leptospirosis (mixed type) about three weeks previously. At the request of the owner, the two remaining dogs were vaccinated, but it was pointed out at the time that the cases were unsuitable for vaccination in view of the undetermined prophylactic value of the vaccine and also the possibility of the animals being in the incubation stage of the disease. One dog died one week after the second injection from typical leptospirosis (mixed type) and the other one came down with what appeared to be a mild case and responded to treatment.

The remaining 22 of the 25 dogs vaccinated are alive to date, October 21, 1944, and none have shown signs of infection in spite of several of them having been exposed to possible street infection.

It is not considered that sufficient evidence is forthcoming from the limited trials to justify the expression of an opinion as to the value of a formalized antigen as an active immunizing agent in the control of canine leptospirosis. This conclusion is reached in view of the fact that no protective immunity tests were carried out with the serum of vaccinated dogs in an effort to determine the relationship between agglutination titers and immunity. However, the opinion is expressed, based entirely on conditions obtaining in this island, that the use of such a vaccine is warranted in view of (1) the apparent lack of immunity of the dogs to leptospiral infection, (2) the high mortality among infected dogs and lack of response to treatment and (3) the possible, although not definite, protective value of the vaccine.

In view of the absence of any systemic reactions following the injections, it is considered that in order to stimulate an increased degree of immunity, that the dosage of the vaccine should be increased from 2cc to 4 or 5cc and the injections to three instead of two; these to be followed by an annual single injection of 5cc.

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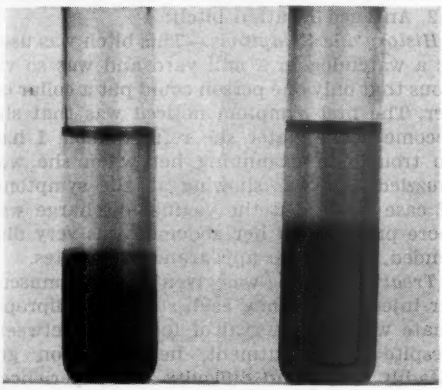
Clinical Reports

Lymphatic Leucemia in a Dog

January 17, 1944, a black, male Scottish terrier, 10 years of age, was presented for treatment for a small abscess on the left side of the head.

Anamnesis.—The owner complained that the dog was not as alert and active as it should be. The abscess was the result of an injury received a few weeks previously.

Symptoms.—The hair coat was dry and rough. The dog was slightly emaciated. Upon further examination the mandibular lymph glands, the prescapular and the popliteal lymph glands were found to be enlarged two to four times their normal size. The temperature, respiration and pulse were normal. A blood examination revealed:



Samples of blood after standing 24 hours. The sample on the left was from the case described—that on the right was taken from an apparently normal dog. The middle ring in the tube at left from the case of leucosis represents white blood cells. The top and bottom layers in each sample are, of course, serum and erythrocytes

Hemoglobin, 8.5gm per 100cc blood
(Normal is 14gm per 100cc)
Red cell count, 3,150,000
(Normal is 6,160,000)
White cell count, 470,000
(Normal is 12,600)
Hematocrit readings:
Red cell volume, 24.2%
White cell volume, 14.5%

Diagnosis.—A diagnosis of lymphatic leucemia was made.

The owner was informed that the dog had an incurable condition and euthanasia was advised.

Necropsy.—The liver was enlarged to about one and one-half times normal size, friable and slightly lighter in color than normal. The surface was smooth.

The spleen was slightly enlarged and of normal color. The surface was covered with small pale nodules.

The internal lymph nodes were normal.

Microscopic examination of liver, spleen and external lymph node tissue revealed a great increase in immature forms of lymphocytes. Many mitotic figures were present, indicating an active condition.

FLOYD E. BEAVER

Ithaca, New York

Atrophy of the Optic Nerve in a Dog

History.—A black greyhound, one year of age, was presented for examination July 15, 1944. The dog had had canine distemper six weeks previously. Complete recovery had been apparent, but the owner soon noticed that the dog's movements about the kennel were restricted and cautious and that he did not appear to be alert. He had been advised to confine the dog to dark quarters but, after two weeks of confinement in the kennel, the animal showed no improvement and so was brought in for examination.

Symptoms.—While walking, the dog would extend the front limbs greatly as if feeling his way in darkness. His neck was extended and his nose to the ground. He often ran into objects. The hind limbs were carried well under the abdomen.

External examination of the eye revealed a marked dilation of the iris but nothing pathological could be seen.

Internal examination of the eye with an ophthalmascope showed the optic disc, or papilla, was striated around its margin. The disc had a yellowish-grey hue and was somewhat diminished in size. Partial atrophy of the retina around the optic disc had occurred. This was characterized by yellow spots or patches varying in size, which allowed the choroid to be seen with corresponding distinctness. Blood vessels of the choroid appeared as a small hairlike network.

Prognosis.—The prognosis in atrophy of the optic nerve is unfavorable as nerve cells do not regenerate. Permanent blindness is certain.

Cause.—The neurotropic virus of canine distemper is the causative factor. The virus has an affinity for cells of the optic nerve, thus causing the destruction of the nerve. The infection descended the optic nerve; thus degeneration of the nerve fibers ending in the retina occurred.

Microscopic Examination.—This examina-

tion revealed neuritis, with infiltration of lymphocytes and fibroblasts in the nerve sheath. It was impossible to determine whether any degenerative changes of the nerve tissue had occurred as the staining method used was hemotoxin-eosin. A few lymphocytes and fibroblasts were noted around the nerve bundles.

Treatment—No effective treatment known.

NEIL C. GUSTAFSON

Lindsborg, Kan.

Rectal Impaction in Dog

A five-year-old, male hound was brought in by a farmer client, saying the hound seemed in severe pain, particularly when attempting to defecate. When I passed a rectal probe the instrument struck something very hard.

The information was then secured as to previous treatment: a pint of mineral oil with negative results, in fact it did not even come through the rectum. Then he poured a bottle of castor oil into the old fellow, and this also remained inside. I don't know why he did not give him something else then, but he took him to a veterinarian nearby. By enemas the owner removed much bony material.

Now it was my turn to try. This was the first one I ever had that I was unable to take care of, but I must admit failure on this case. Usually I can break down the mass by water enemas, mineral oil enemas, removing a small bit at a time in the return flow. One case took me three days to completely clear the rectum of bone. With mineral and castor oil fore and the oil and water aft, and gentle manipulation, I could not break this one down or cause it to loosen. I even resorted to nembutal intravenously in order to relax the rectum, and prevent pain, but my labors were to no avail. The mass could be plainly felt through the abdominal wall, and I guessed the impacted mass to be about 10 inches long.

Whether the dog died from my manipulation, from the castor oil, or the long interval of toxin absorption, I do not know, but die he did a day and half after entering my clinic.

On post-mortem examination I found about 10 inches of the bony mass. The posterior end of it was about 2 inches in diameter and so hard I could not break it with my fingers or an instrument. The mucosal folds had become quite inflammed and enveloped it securely.

Mineral and castor oil by mouth, water and mineral oil enemas, manipulation, etc., all had failed to move this severe obstipation.

After losing a case, I always feel that perhaps something else could have been done, and am wondering if any practitioner who reads this can tell me something that might help me on such a case in the future.

Charlotte, N. C.

G. R. ARMSTRONG

Pyometra in the Bitch

1. An eight-year-old Alsatian bitch.

Symptoms.—Temperature, 102° F., irregular appetite, loss of condition, dullness, lying in cool places, occasional vomition, tendency to constipation and a vaginal discharge. The enlarged uterus could be palpated easily.

Treatment.—Tonics and potassium iodine were first used in conjunction with vaginal douches, but without success.

Hypophysin was then given subcutaneously in doses of 2cc, i.e., 20 Vögtlin units every four days. Six injections were given. The bitch was normal in appearance, after two injections. The uterus was normal after four injections.

This case was treated two years ago and there has been no recurrence of the condition.

2. An aged Alsatian bitch:

History and Symptoms.—This bitch was used as a watchdog in a mill yard and was so vicious that only one person could put a collar on her. The first symptom noticed was that she become docile; later she refused food. I had no trouble in examining her when she was muzzled. She was showing all the symptoms of case No. 1, but the vaginal discharge was more profuse and her abdomen was very distended, giving the appearance of ascites.

Treatment.—She was given two intramuscular injections of 3mg each stilbestrol dipropionate with an interval of four days between. Despite this treatment, her condition got steadily worse and difficulty was experienced in walking.

She was then treated with posterior pituitary as in the first case. When she came for the second injection it was noticed that her vicious temperament had returned. Four injections were given as before and the bitch made an uninterrupted recovery, nine months having elapsed since the last treatment.

3. A four-year-old grayhound bitch:

History.—This bitch experienced some difficulty at whelping time. About two weeks later she had a vaginal discharge, lost condition and lactation was decreased.

Treatment.—I was anxious to try stilbestrol in this case, but decided against it owing to its action on the mammary glands. Two injections of posterior pituitary extract (infundin) were given, with an interval of a fortnight. When the bitch was brought in for the second injection there was no doubt about her improvement.—R. P. Pierse in *Vet. Rec.*, 55:43, p. 389.

Hematoma of the Testicle in a Dog

July 31, 1944, a mongrel collie about 11 years of age, was presented for treatment with the history that the scrotum had commenced to swell about three months previously and, without apparent discomfort to the animal, had enlarged continuously since. He had not eaten regularly during the past several days. To the owner's knowledge there had been no injury of the scrotum.

The dog was showing extreme evidence of sensitivity to the part, which was inflamed and swollen. He was listless and extremely cross. The scrotum was firm with some fluctu-

ation. The spermatic cord felt greatly enlarged and only the right testicle could be palpated.

A tentative diagnosis of tumor was made and surgery advised. The dog was confined in dorsal recumbency with the pelvic limbs spread wide to expose the scrotum. Ether anesthesia was used. The scrotum and inguinal region was thoroughly cleaned and shaved. Strict asepsis was used and a shroud was placed over the field of operation.

An incision was made over the left external inguinal region and, by blunt dissection, the tunics, which were completely filled with coagulated blood, were exposed through the incision. A fixation ligature was placed high on the spermatic cord and affected tissue removed.

Examination of the excised mass revealed that the left testicle had completely atrophied; only the epididymis being distinguishable. The tumor consisted of an organized blood clot which filled the tunics, and extended high in the spermatic cord.

The right testicle was examined and found only slightly affected, so was not removed.

The incision was then closed with interrupted sutures and the wound treated with sulfanilamide. Recovery was uneventful.

E. H. STRATHMAN

Rockford, Kan.

Correction

In the clinical report "Little Pig Vaccination" beginning on page 70 of the February issue a transposed phrase gives the dosage of virus incorrectly: ". . . giving the pigs 1cc of anti-hog cholera serum and 3cc of virus per pound of body weight" should read "giving the pigs 1cc of anti-hog cholera serum per pound of body weight and 3cc of virus." That is to say, that 3cc of virus was given to all the young pigs regardless of weight but the serum dose was graded according to weight, e.g., a 7-pound pig received 7cc, a 12-pound pig 12cc, etc. The correct dosage is given farther down in the column (p. 71) in the report.

So many have written me concerning this obvious error in dosage (in fact from eight different states), that it may be well to make this correction for any who may have been puzzled by the statement but who have not written me concerning it.

R. B. SPEARING

Manley, Ia.

Acute Mastitis with Toxemia in a Mare

I was called to treat a case of acute mastitis in a mare that presented some unusual features. This mare had had several foals. Her last foal had been weaned several weeks prior to the onset of this attack of mastitis, hence the cause of the ailment was rather obscure.

This mare had a temperature of 105.5° F. Anorexia was complete. Pain in the region of the hind legs made walking difficult. The unusual gait was what first attracted the owner's attention and led to the discovery of the condition. Examination revealed only one side of the udder affected; that side being hot, swollen and painful with a thick creamy secretion. The other side was normal in appearance and the secretion was normal.

Ten cubic centimeters of sulfanilamide in oil were injected into each teat orifice.

The normal appearing half of the udder was infused on the theory that it would do no harm in the non-lactating udder and would do good in case of extention of the infection to that portion of the gland. Two one-ounce capsules of sulfanilamide powder were given orally.

Clinically, recovery was practically complete in 24 hours.

S. BENDER

Greenwich, N. Y.

In Yesteryears

The seventh International Veterinary Congress was held at Baden-Baden, Germany, during the week beginning Aug. 7, 1899, with 30 nations represented; four from the Western Hemisphere. The United States had representatives from the Bureau of Animal Industry, Harvard University, The Massachusetts Veterinary Medical Association and the American Veterinary Medical Association. Eight general topics were considered: (1) Prevention of spread of epizootics in consequence of international cattle trade; (2) Prevention of foot-and-mouth disease; (3) Newest suggestions for an effectual meat inspection; (4) Adoption of uniform anatomical nomenclature for surgery; (5) Prevention of tuberculosis in domestic animals; (6) Use of flesh and milk from tuberculosis infected animals; (7) Prevention of swine epizootics, and (8) Extension of veterinary education.

The 36th annual meeting of the American Veterinary Medical Association was held at New York City, beginning September 5, 1899. There were in attendance 114 members, two official delegates, 97 visiting veterinarians, 62 ladies and 19 lay visitors. Among the members present were N. S. Mayo, C. E. Cotton, John R. Mohler, W. L. Williams, J. Payne Lowe and E. B. Ackerman. The program included papers on Azoturea by R. P. Lyman, Rabies by J. M. Parker, Disinfection by E. A. A. Grange, Dietetics by W. H. Dalrymple, Ulceration of the stomach of equines by C. A. Cary, Municipal meat inspection by E. B. Ackerman, The veterinarian of the future by N. S. Mayo and a number of others on surgery, milk sanitation, control of bovine tuberculosis, use of anesthesia, control of glanders, chicken cholera, etc.

In 1899, the British Government was buying horses on the American market. At Chicago buyers were trying to obtain 1200-pound "gunners" for shipment to the British Army in South Africa. Horse meat was being exported to Europe in 1899. It was cut into pieces, salted and packed in barrels for use in sausage making. The Norwegian government had some correspondence with the U. S. Department of Agriculture in which the question of diseased horse meat being included in the shipments was the issue. Norway was advised that she could make sure of obtaining a wholesome product by demanding a certificate of proper inspection for each lot shipment.

Figures prepared by the Department of Agriculture in 1899 showed that beef cattle had dropped from 37 million in 1890 to 28 million in 1899. In 1890 there were 589 steers and in 1899 only 365 per 1,000 population.

There were antivivisection fanatics in 1899 also. In answer to the campaign against vivisection in Chicago, Dr. W. J. Martin of Kankakee at a meeting of the Illinois Veterinary Medical Association suggested the fanatics direct their efforts to prevent vivisection of an undoubted harmful nature, namely, the cruel and unwarranted surgical practices of lay surgeons operating as expert dehorners and castraters.

In Vol. XXIII, No. 7 (Oct., 1899), of the *American Veterinary Review*, p. 482, Dr. W. E. French, of Daytona, Fla., reported finding heartworms in a three-year-old, setter bitch. He described the typical symptoms as we see them today. He identified the adult worms as *Filaria immitis* and suggested that a study of the life history of this parasite might result in the discovery of logical prophylactic measures.

Hypodermic tablets had been introduced in the 1890's and Dr. A. Liautard, Editor of the *American Veterinary Review* commented upon them as follows: "The employment of hypodermic medication in the treatment of animals is one of the most important steps in the advancement of veterinary practice. Buntin Drug Co. of Terre Haute, Ind., are pioneers in the introduction and preparation of hypodermic tablets for veterinarians. Their tablets contain only the medicaments with chemically pure inert sugar, which preserves the activity of the drugs, preventing deterioration, to which the most valuable alkaloids are inclined, when uncombined and subjected to even slight atmospheric exposure." Many of the hypodermic tablets used now were listed in 1899. Among them atropine sulphate, ½ grain at $1.60 per 100 and eserine salicylate, ½ grain, at $5.50 per 100.

Among the instruments offered in 1899, were thermo-cautery sets of the pump pressure type at $20.00 per set; hypodermic syringes at $5.00 each with extra needles, straight or curved, at 35 cents each; and dental floats at $3.00 each.

Tuberculin and mallein for diagnostic purposes and tetanus antitoxin for prophylaxis were being used in 1899. Tuberculin in those days cost 15 cents and mallein, 20 cents per injection. Very favorable reports were being made in the literature in 1899 on the use of tetanus antitoxin in the treatment of clinical cases of tetanus in horses.

C. D. FOLSE

Kansas City, Kan.